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SOAP and SANITARY CHEMICALS

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AS THE EDITOR SEES IT

LOOKING over reports of various and sundry corporations for the first quarter of 1948 and comparing the figures with 1947 and previous years, we have received quite a jolt. The rate at which business expenses have increased over the past year,—and apparently still are increasing,—compared to sales and net earnings is nothing short of startling. For some months past, we have heard numerous plaints from small manufacturers about the rapid rise in the cost of doing business. But it appears that this condition is not confined to small firms alone. Recent reports of large corporations reflect an almost identical situation.

All business has been aware for some time of the constant rise in costs of labor, overhead, and general business expenses and the shrinkage of net profits. Where gross business keeps expanding, the problem is naturally not as serious as in cases where sales have fallen off and the rise of expenses threatens to exceed income. However, it is but a matter of time, if the present trend continues, before this situation may apply to every business. Sales cannot keep expanding forever in the race with rising expenses. Sooner or later, the end must come. Many manufacturers and distributors of soap, detergent and chemical specialties are now realizing this fact more pointedly than ever. All of us, not excluding our political heros in Washington, decry any thought of a major depression,—but if a continuation of this trend can lead aywhere else, we would like to know just where.

HIGH soap prices of the past year or so have not engendered a particularly friendly feeling in the breast of the average housewife or industrial buyer of soaps. Conscious of the high prices and noting what have appeared to be very juicy earnings by soap manufacturers, the conclusion that these profits have been squeezed right out of the public hide would seem to be quite logical. And whether logical or not, and whether there is more to the situation than meets the eye, this *is* the conclusion of the general public. References to the "robber soap barons" and similar uncomplimentary tabs are more common. The industry spends millions per year in advertising to build goodwill for its products,—and sells a lot of soap,—but if our recent observations are not too far off the target, the public believes that soapers have not hesitated to squeeze out every dime of profit which the traffic will bear.

In feeling for a long time past that something should be done regularly and often to give the facts to the public in ABC language about the whys and wherefores of soap costs and prices, we seem to be alone. If any particular effort has ever been made in this direction, it has missed our notice. The industry has a strong case, but if the average housewife, or purchasing agent, or speaker before these women's clubs have an inkling of the facts, those we have contacted give no indication of it. And for small soaper or large, the long-range effect can be harmful or even dangerous.

IS it a moral victory or has somebody just thrown the poor old dog a bone? New York City, America's last stronghold of the nickel carfare and of schools without soap and towels, has finally capitulated to the march of progress. Come July first and the nickel carfare is no more. But more startling than that, the Board of Estimate has budgeted $100,000 for soap and towels in the public schools. Some of the million or more New York kids for whom the *study* of cleanliness and sanitation has been a must these many years, will now for the first time in the city's history be able to *practice* what they have learned.

That the practice of hand-washing will be on a very small scale is quite apparent from the

size of the appropriation, someting like ten cents per pupil per year. But not all the lucky kids will be in on this new soap-and-towel deal. Only about one school in every six or seven will be thus equipped, all that the present proportions of the budget will permit. That the Board of Education asked for $640,000 to teach the practice of cleanliness is of no moment. The city seers of finance and figures decided $100,00 are enough for any such frills in education.

Some of New York's crusading newspapers even refuse to accept this ten-cents per child as a moral victory. They call it niggardly and preposterous. Obviously, it is all that and more. In fact, it is nothing more than throwing a bone to the growling dog, the latter in this instance being the parents' associations which have been fighting for soap and towels for years. But at least it is a start. Maybe if the dog keeps on growling, more kids will get soap and towels a year hence.

NOT so long ago, we had an opportunity to hear the director of purchases for a large mid-west hospital speak in Chicago. Many leaders in the janitor supply and sanitary chemical fields also had the same opportunity because it was before the recent annual meeting of the National Sanitary Supply Association that this speaker,—a lady, an excellent speaker who did not pull a punch,—gave some good advice which many companies and their salesmen might well take to heart. She hit right out from the shoulder and her mention of the "misrepresentative huckstering type of salesman" sounded a responsive note.

In discussing the dilemma of a hospital purchasing executive, the speaker mentioned "enforced frugality" and cost of personnel as the big item of maintenance expense. And she continued: " . . . the difference between the dollar and the dollar ninety-five per gallon product often seems monumental." With this latter statement, we were inclined to disagree, in principle at least, even though we must admit that theory and practice in actual purchasing on a limited budget do not always jibe.

In our experience over the years, we have seen many products,—in some cases almost chemically identical,—which were worth twice as much or more in real performance as some competing products. This condition is common. And although it is not always true that the higher cost products are better, those that continue to command higher prices year in and year out usually have to be better. And better products may save many times their extra cost in maintenance labor,—and they may obviate the risk which always attends the use of a cheaper, inferior product.

Buyers over the years may pay out a lot of money for that assurance which goes with the higher-priced product. But one unfortunate experience with a damaging inferior product of questionable ancestry can cost far more. In ordinary maintenance operations, labor has for years been accepted as approximately ninety per cent of the cost. Today, it is undoubtedly even higher. So, if by saving man-hours of expensive labor through use of a higher-priced product, may not the higher initial cost be justified? From long observation, we believe that it may be and is justified in most instances.

HIGH-FLOWN advertising claims based on flimsy evidence, the cause of considerable disrepute to national advertising in the decade preceding the war, seem to be reappearing. Coincidentally, the American Management Association has prepared a new code of ethics designed to curb the use of faulty advertising research data. This move obviously is aimed at the growing list of research charlatans whose "findings" will prove almost anything a marketer desires to prove, and at those marketers whose advertising claims may be based on such "findings."

That some merchandisers will use any sort of alleged evidence as long as it comes to them from an outfit with a high-sounding name containing the word, "research," seems quite apparent. These supposed researchers make a handy "out" if the bluff is called. But they can also build up a new reservoir of widespread disrepute for all consumer advertising. If the new AMA code does any real good in nailing them to the mast, we are for it one hundred per cent.

Liquid HAND CLEANERS

By Milton A. Lesser

Potash coconut oil soaps still lead the field, but there are many modifications and new developments, including non-soap products

LIQUID hand cleaners occupy a major place in the American system of personal cleanliness. Although one hears considerable talk about the encroachment of synthetic detergents, liquid potash soaps continue to retain the dominant position among the fluid types of hand cleaners. As remarked by Lane and Blank, (1) authorities on cutaneous detergents, soaps are efficient and satisfactory cleaners for an overwhelming majority of people.

The use of liquid hand or toilet soaps has increased enormously during the last two decades. (2) They are found in the lavatories of public buildings, restaurants, hotels, hospitals, clubs, theaters, and schools—indeed in almost all places where people congregate. Liquid soaps are standard cleansers in the washrooms of most office buildings and the great majority of industrial plants. More and more dentists and doctors are using liquid hand soaps in their offices. In response to growing demand, manufacturers of liquid soap dispensers have improved their products and a large variety of sturdy and practical models are available. These not only aid the public in using liquid soaps quickly, efficiently and economically, but are also important factors in facilitating the sanitary maintenance of washrooms.

There are a number of good reasons for continued growing popularity of liquid hand soaps. For one thing, there is the general impression that washing with the liquid form of soap from a dispenser is more hygienic or sanitary than cleansing with the communal cake of soap. In contrast to cake or powdered soap, there is far less waste when liquid soap is supplied. Cake soap often disappears at an alarming rate from lavatories and seems to have a particular attraction for the petty pilferer and other types of "collectors." Convenient to use, a small amount of a good quality liquid soap works up into a rich lather and, being made from a potash base, rinses off more rapidly than cake or powdered soap. (3)

Another advantage inherent in liquid hand soap is the fact that it offers opportunities for the smaller manufacturer and distributor. As remarked by Boyle, (4) "It is one of those products for which the advantages that large-scale production possesses over small-or medium-scale production are not so overriding." Several years ago, in a discussion on liquid soaps, Levitt (5) commented on the excellent distributing job being done by manufacturers of sanitation specialties.

There is surprising agreement among various authorities on the requirements of a good liquid toilet soap. According to Ekmann, (6) a European authority, the desirable properties of liquid soaps include clarity, neutrality, rapid lather production but not too great a volume of lather, good detergent action, satisfactory fluidity or viscosity, and an agreeable but not too lasting odor.

This is in line with the proposed British specifications (7) as well

as with the established Federal Specification (P-S-618a) for liquid toilet soap. According to the American standard, liquid toilet soap shall be a clear solution of pure vegetable oil potash (or potash and soda) soap, with or without glycerine or alcohol, suitably perfumed, and free from all foreign matter. It should form a satisfactory lather quickly and have no objectionable odor, other than that from coconut oil. Other details of the specification require that the total anhydrous soap shall not be less than the equivalent of 15 per cent potash soap. Limits for matter insoluble in alchohol, free alkali and chlorides are also given. It is also specified that more than traces of sulfates and sugar shall not be present.

Although this standard sets the soap content at 15 per cent, commercial customs and practical considerations permit a soap range above and below this level, depending on the requirements of the ultimate user. It is obvious, for example, that a soap which is satisfactory for office employees may not be an effective liquid cleaner for the hands of shop workers. While there are no established soap concentrations for the various consumer groups, the data (8) supplied by one manufacturer of concentrated liquid soap is indicative. He recommends for use an 8 per cent soap for grade schools, hotel public washrooms and the like; a 10 per cent soap for high schools, consolidated schools, restaurants and such; a 12 per cent soap for offices, banks, clubs and light factory use, and, a 20 per cent soap for factories, garages, vocational training schools and similar establishments.

Pertinent in this connection is the observation made by Thomssen and Kemp (9) that down to 12 per cent, a coconut oil liquid soap will give a ready, profuse lather. Below this point, however, the soap does not give a good lather unless a particularly large quantity is used. Hence it is self-evident that too low a soap concentration is hardly economical in the long run, to say nothing of lowered detergent efficiency.

Liquid soaps may be made in one of three ways: (a) by saponification of oils, (b) by reacting fatty acids with alkali, and (c) by dilution of a prepared concentrated potash soap base. Even though the Federal specification permits the use of some soda soap, this practice is not usually recommended. (3) The presence of soda soap in a liquid toilet soap often causes trouble when the product is used by causing cloudiness and by clogging the dispensers. (9) Practically all modern soapmakers use straight caustic potash, either liquid or solid, when making up liquid toilet soaps.

When suitable oils are used with caustic potash, there results a soap that will give a rich lather and good detergent action at comparatively low concentrations. Of course, coconut oil is the most extensively used oil for liquid soap manufacture, especially where rich lathering and easy flowing qualities are desired. Sometimes the coconut oil is replaced in part by palm kernel oil, or by palm oil which gives added body to the soap, or by other vegetable oils. Various porportions of olive oil or olive foots, for example, may be used with coconut oil to yield a blander soap, one that shows less of the irritative tendencies associated with a straight coconut oil soap. Soya bean oil, corn oil, teaseed oil, or their fatty acids, and other "bland" oils are used for the same purpose in place of olive oil.

DURING the war, a number of oils and other materials, not ordinarily used in liquid toilet soap production, found their way into the soft soap kettle. (10) Some of these emergency oil combinations turned out surprisingly well and, as remarked by Bachrach, (2) many liquid soap makers may never go back to 100 per cent coconut oil soaps. Of course, many of these emergency combinations were discarded as the supply situation improved. It is disconcerting however, to find that some liquid hand soap manufacturers still seem to think that they can get away with these emergency formulas indefinitely.

Because of the war time need for recovering all glycerine possible, many potash soap manufacturers learned how to work with fatty acids. As pointed out by Schwarcz, (3) fatty acids have certain advantages and disadantages in potash soap production. On the positive side of the ledger is the fact that with fatty acids there is a time-saving element in that saponification takes place very rapidly. Greater uniformity is also possible and there is a larger soap yield.

On the other side of the ledger is the observation that liquid hand soaps made from fatty acids do not contain the glycerine normally present in a soap made from whole oils. The glycerine present in soaps made from straight oils is said to act as a preservative and as a preventer of rancidity. Fatty acid soaps without the glycerine, some soapmakers believe, do not function as well in soap dispensers. If the dispenser is not used for some time, such a soap will have a greater tendency to clog the outlet. With some fatty acid combinations the factor of instability may also enter the picture. Odor is not as much a problem today as formerly. Nevertheless, the use of fatty acids in potash liquid soaps continues to grow at the expense of whole oils.

Various materials may be included in a liquid hand soap formulation to improve clarity, improve stability in the package or dispenser, increase the body or viscosity, exert an emollient action, or to impart certain desirable effects, such as a solvent or an antiseptic action. Alcohol and glycerine are familiar examples of such additions, but a number of other compounds have been employed during recent years with marked success.

The perfuming of liquid hand or toilet soaps is a subject that deserves more attention than can be given in this review. In selecting a suitable perfume for liquid soap, due attention must be given to its stability and solubility; even distribution of the perfume is absolutely necessary. (11) However, this phase of soap formulation has been discussed by various authorities (3, 6) and expert advice is available from most suppliers of commercial perfuming materials. Perfume compounding by the soapmaker, himself, is always dangerous. The same holds true to some extent for

soap coloring agents. In general it may be said that water-soluble, alkali-resistant dyestuffs may be used to tint liquid soaps. As a rule, one pound of most suitable dyes will color about 1,500 gallons of liquid soap, but fluorescein will tint about twice this quantity. (5, 12) Color should be used cautiously so as to avoid the production of tinted suds when the soap is used.

AS in all phases of the soap industry, the production of a liquid hand soap calls for skill and experience, and is not for the amateur. Many formulas are available. They are useful guides but cannot be expected to replace expert "know how." Illustrative of the preparation of a straight coconut oil soap is the formula and procedure given by Thomssen and Kemp, (9) as follows:

Coconut oil	130	parts
Caustic potash lye, 28°Be.	135	"
Water	150	"

Run the oil into a tank or kettle equipped with an agitator and a closed steam coil; heat to 125°F and run in the potash lye. Saponification proceeds rapidly and the addition of cold water from time to time controls swelling and prevents boiling over. After saponification is completed, the soap is tested and adjusted as required with fatty acid or potash. If desired, water may be added to the finished soap in the kettle to bring it down to the required concentration.

Another modification, (12 13) containing added glycerine for its emollient and other beneficial effects, yields a liquid hand soap suitable for workshop washrooms and the like:

Coconut oil	220	parts
Caustic potash solution, 38°Be.	157	"
Glycerine	26	"
Water	418	"

To illustrate the use of fatty acids in liquid soap manufacture, there may be cited the following formula (14) which yields a product containing 15 per cent potash soap. Employing the semi-boiled process, the soap is made from:

Coconut oil fatty acids	12	parts
Soybean oil fatty acids	3	"
Potash solution, 50°Be.	9	"
Distilled water	76	"
Potassium chloride	1	"

For the manufacturer who does not wish to invest in soap-making equipment and for the sanitary products distributor, the most feasible method and one that is widely employed, is to buy a concentrated liquid soap or a more concentrated liquid soap base. Many soap makers, including some who specialize in this field, usually provide concentrates containing 40 to 50 per cent anhydrous potash soap. Base soap is also made in strengths of 55 to 65 per cent.

As already indicated, many suppliers of such products also provide appropriate dilution instructions which specify the amount of distilled or soft water required to make liquid hand or toilet soaps. Most of these concentrates are already perfumed and some come suitably colored. If desired, glycerine, alcohol or both may be added to the liquid soap, as in the following example: (6)

Potash soap 40%	100	parts
Distilled water	75	"
Alcohol	25	"
Glycerine	5	"

This soap is stored for at least two weeks, then decanted off or filtered.

Clarity is Essential

ALTHOUGH it may not be necessary with some of the finer grades of bases, most liquid soaps are chilled to at least 60°F, and preferably lower, and are filtered before packing to remove the precipitate of partially hydrolyzed soap, insoluble soaps, salts, etc. which may result from dilution. As a general rule, it is best to hold the liquid soap in storage for several days at least before filtering so that finely divided colloidal particles may agglomerate to a size sufficiently large to be retained by the filtering medium. Otherwise the soap solution may not stay clear and bright. Filter aids such as activated carbon, fuller's earth and other materials are considered helpful in giving clarity and brilliance to the finished soap. (15)

While the clarity of liquid hand soap is no indication of its cleansing efficiency, freedom from turbidity is very often taken as an index of quality and is an established requirement of a good product,—a rule which applies even more rigidly to soaps sold as hair shampoos. In discussing the clarity of liquid soaps, Chilson (16) has pointed out that filtration is of course essential but that the best filter will not clarify a soap permanently that has not been properly made in the first place. In his opinion, the common causes of turbidity are: (a) use of water which has not been distilled, (b) insufficient aging before filtration, (c) incomplete saponification, (d) presence of unsaponifiable foreign matter, (e) failure to chill before filtration, and, (f) carelessness in manufacturing procedures.

However, turbidity sometimes develops even with a properly made, clear liquid soap. This is sometimes due to the glass containers in which the soap is packaged, some glass etching to form insoluble silicate and soap compounds which cause clouding. Tin cans and drums may also cause turbidity. One explanation is that the excess "dope" used to seal the seams, or the soldering flux, may react with the soap to cause clouding and discoloration. (3)

Recently, Kranich (17) reported that through proper formulation, water purification, mechanical refrigeration, de-stearinization, aging, special filtration, and the use of various chemical additives, the liquid soap industry has solved the problem of clarity maintenance with a considerable degree of success.

The use of additives to maintain clarity has received considerable attention during recent years. Of course, the idea is not new and materials like glycerine, sugar or alcohol have long been added to liquid soaps to lower the freezing point and to prevent cloudiness and foaming in the container. Glycerine is not considered an objectionable addition (15) but rather is classed (4) as a desirable component of liquid toilet soaps because it increases fluidity and has an emollient effect upon the skin. Although sugar improves the clarity and makes a soap look thick, it also leaves the hands sticky and is classified

definitely as adulteration. It is seldom, if ever, present in liquid soaps today. The clarifying action of alcohol is not considered necessary in a properly made liquid soap. It is seldom used in the general type of liquid hand soaps but does find frequent employment in the so-called surgical soaps and hair shampoos. Imparting a certain amount of antiseptic action and serving to lower the freezing point, alcohol also tends to act as a preservative and may retard rancidity, another possible cause of clouding. (3) To avert trouble due to rancidity, some manufacturers use various antioxidants and preservatives. (18)

More recent investigations have been concerned with other types of clarifying agents. It has been found, (19) for example, that the cloudiness that forms in liquid soaps stored in glass containers can be prevented by adding 0.07 to 2 per cent of commercial sodium silicate to the liquid soap, heating to 70°C., allowing to stand for one week, cooling to 4°C., and filtering. The final product may have a silica content of only 0.016 per cent, but this minute amount, it is claimed, is sufficient to keep the soap clear and in good condition.

Sequestering Agents

CONSIDERABLE study has revolved around the use of phosphates, valuable for their sequestering action, in liquid soaps. Some years ago sodium hexametaphosphate and potassium tetra pyrophosphate were recommended for the treatment of water to be used for liquid soap manufacture as a means of reducing hardness effects. (18) According to patent specifications, (20) the use of about 1 to 2 per cent of sodium hexametaphosphate, based on the anhydrous soap content, will serve to prevent the clouding of liquid soaps in glass containers.

The current status of the alkali phosphates in liquid soaps has been reported by Bachrach. (21) He states that these compounds are recommended in soap making to obtain clear liquid soaps, for buffering excess alkali, to clarify soap solutions containing unsaponified oil or fatty acids, to soften water, and to aid mildness. In practice, the best mixture of phosphates comprises two parts of trisodium phosphate and one part of tetrasodium pyrophosphate. He notes that such use of phosphates may also have some value to the many firms who buy potash soap bases to make their own liquid soaps. In addition to its value for imparting brilliance to liquid soaps, it may be mentioned that tetrasodium pyrophosphate is also a very effective water softener and of real value as a means of increasing lathering properties. (22)

During the last few years much interest has revolved about newer organic sequestering agents as means of maintaining the clarity of liquid soaps. Especially noteworthy are the poly amino carboxylic acids and their salts, which are now available under various trade names (e. g. Sequestrene A, Nullapon B, Modern Clairifyer). Studies of these materials, reported by Kranich, (17), indicate that the presence of minute proportions of these agents in finished liquid soaps is "remarkably successful" in stabilizing the products against cloud formation. The mechanism by which such agents prevent turbidity has been discussed in detail by Zussman (23) at the January, 1948 meeting of the Potash Soap Association. Useful data is also supplied in patent specifications. (24)

Heavy Duty Hand Soaps

MORE specialized liquid hand soaps, sometimes called heavy-duty soaps, may contain adjunct cleaners or solvents. These liquid soaps are designed to perform a more thorough and satisfactory cleansing job for industrial workers who have dirt and soil on their hands difficult to remove with ordinary liquid soap. Schwarcz (3) has pointed out that in some machine shops and factories even an 18 or 20 per cent coconut oil soap may not clean hands covered with dirt or grease. It is therefore sometimes advisable, in order to get the proper cleaning effect, to add about 3 per cent of pine oil as a solvent or up to 2 per cent of a mild alkali such as trisodium phosphate.

Manufacturers of liquid soaps have known that the addition of pine oil increases the cleaning action of the soap and also imparts a pleasing, "sanitary" odor to the product. Illustrative is the following formula (12) developed for use in washroom dispensers:

Coconut oil	160	parts
Potassium hydroxide (89%)	46	"
Pine oil	40	"
Water	754	"

Employing both pine oil and ammonia as adjuncts is a European formula (25) for a liquid soap for cleaning very oily and greasy hands. It is made as follows:

Palm kernel oil	100	parts
Pine oil	50	"
Caustic potash (50°Be.)	52	"
Water	50	"

The finished soap is dissolved in 100 parts of water and 10 parts of ammonia (specific gravity 0.91) is added. Alcohol may also be added if desired.

Medicated, antiseptic and surgical "scrub-up" soaps form another group of specialized liquid soaps. However, products of this type have been reviewed previously in *Soap and Sanitary Chemicals*. (26)

There are occasions, as for individuals with sensitive skin or during the winter months, when a bland or emollient effect is desired in a liquid hand soap. The usual types of superfatting agents suitable for other kinds of soap often cause clouding or separate when incorporated in liquid soaps. However, where a uniformly turbid soap is not objectionable, it is possible to incorporate superfatting agents without causing seaparation. This is brought out in a patented method (27) for making potash liquid soaps containing superfatting substances like stearic acid, lanolin, higher fatty alcohols, and higher esters of glycerine or glycol. Procedures used in the formulation of liquid shampoos may be of interest in this connection.

As previously mentioned, the use of bland oils serves to produce a more bland liquid soap. Olive oil is especially useful in this connection and is used to make the so-called liquid castile soaps. (9) These may be supplied as pure olive oil liquid soaps or as products containing 80 to 90 per

(*Turn to Page* 189)

T. G. A. Meets, Elects Pennock

THE election of Charles A. Pennock, president of Hudnut Sales Co., New York, as president of the Association; pleas for the reduction or elimination of the 20 percent excise tax on toilet preparations; a discussion of ways to stimulate business from the standpoint of the manufacturer, wholesaler or dealer and retailer; and reports of technical developments within or affecting the industry were the highlights of the 13th annual convention of the Toilet Goods Association, held May 18-20, at the Waldorf-Astoria Hotel, New York.

In addition to Mr. Pennock, who succeeds Paul H. Douglas of Bourjois, Inc., New York, as president of the T.G.A., the following officers were chosen at the meeting: Vice-presidents, Norman F. Dahl, Prince Matchabelli, Inc.; John A. Ewald, Avon-Allied Products, Inc., both of New York; Davis Factor, Max Factor & Co., Hollywood, and H. J. Lehman, Wildroot Co., Buffalo, N. Y.; secretary, Joseph Kehoe, Dorothy Gray, Ltd., and secretary, Richard Stern, Ferd Mulhens, Inc., both of New York. Directors named to serve include: A. C. Burgand, Carr-Lowrey Glass Co.; Gerald J. Danco of Gerald J. Danco, Inc.; Jean Despres, Coty, Inc.; Herbert H. Harris, Parfums Charbert; Ralph Lewis, Harriet Hubbard Ayer, Inc., and Martin Revlon, Revlon Products Corp., all of New York, and Frank N. Langlois, Rexall Drug Co., Boston.

Main emphasis in reports of the president, executive vice-president and counsel of the Association, presented on the first morning, was the need to remove or reduce the excise tax on the industry's products. The tax, in the opinion of the first three speakers, is responsible in a large measure for the reduced volume of business the industry has been experiencing in the past two years. Efforts to have it removed were outlined in detail by Mr. Mayham, executive vice-president and Hugo Mock, counsel for the T.G.A. In his talk, Mr. Douglas described the tax as "an additional income tax," which "puts the industry at a terrific disadvantage in the eyes of our customers." Mr. Douglas also blamed complacency on the part of the retailer and reliance upon him to an excessive degree by the manufacturer as largely responsible for the decline in the industry's volume of business.

CHARLES A. PENNOCK

STEPHEN L. MAYLAM

The efforts of the Association to persuade legislators in Washington of the need to remove the 20 percent excise tax were described by S. L. Mayham as successful in that "with few exceptions, every member of the house and senate is now convinced that cosmetics and toilet preparations are necessities, that the tax is discriminatory against women and especially the working woman, and all of them are committed to repeal of the tax at the earliest possible moment when budget requirements of the government will permit it."

Following Mr. Mayham, counsel for the T.G.A. Hugo Mock discussed the problems of the industry from the legislative standpoint. He reviewed many of the laws affecting the toiletries and cosmetic industry and the philosophy underlying them.

The report of the director of scientific research and standards was presented by Dr. H. D. Goulden, who reviewed the work of his group as it pertains to checking on claims made in advertising, the issuance of standards for raw materials used by the industry's manufacturers and the publication of the group's proceedings. He also told of the establishment of a research program at Yale, which includes a survey of the literature as to the irritant properties of some 1,200 materials used in the manufacture of toilet preparations and soaps.

The first day's morning session concluding with an expression of gratitude by the newly elected president, Charles A. Pennock.

Presentation of the Charles S. Welch Memorial Award to Charles of the Ritz, Inc., New York, for the "best" package of the year was the highlight of the first day's luncheon. Following the award which was presented to Richard Salmon of Charles of the Ritz by Joseph Keho of Dorothy Gray, Ltd., New York, Herman L. Brooks, honorary chairman of the board of directors and past president of T.G.A. presented retiring president Paul Douglas with an inscribed silver gavel.

The afternoon session of the first day opened with a brief report by the executive secretary of the National Toilet Goods Manufacturers Association of Canada, who discussed regula-

tions under which the Canadian industry operates.

A prediction that the sales volume of the toiletries and cosmetics industry will decline during 1948 as compared with 1947 was made by Jacob Baker of Econometric Institute, New York, as a result of more normal supplies of other consumer goods becoming available. He indicated that the southern and western areas of the U. S. should be cultivated more effectively as good possible sources for future business.

Continuing the discussion of the convention's theme: "The Outlook for Cosmetic Sales in Competition for the Consumer's Dollar," three retail store buyers and merchandisers of cosmetics and toiletries representing the department, drug chain and syndicate type stores expressed their views as to why volume has declined recently. The three speakers: Leon Margolis of Wm. Filene Sons Co., Boston; Max J. Knight, Walgreen Drug Stores, Chicago, and Loren C. Shockley, McCrory Stores Corp., New York, placed major responsibility for the slump on the tax. Minimizing consumer awareness of the tax by including it in the final retail price was recommended. Main emphasis as to how to encourage greater volume in the industry was on new and improved products, better sales promotion and merchandising methods and simplification of lines.

The discussion of the convention theme continued at the morning session on the second day of the meeting, May 19, when the views of the wholesale and the independent druggist were presented.

Speaking for the drug wholesaler, Charles T. Lipscomb, Jr., vice-president of McKesson & Robbins, Inc., New York, stated that intensified promotional selling, plus more, better trained salesmen representing wholesalers will bring about a considerable improvement in sales of cosmetics and toiletries. Mr. Lipscomb expressed the belief that "increased sales through drug wholesalers will improve the outlook for cosmetic sales in competition for the customer's dollar." The role of the drug wholesaler in relation to the manufacturer and the retailer was described by Mr. Lipscomb, who explained a four point program for training salesmen recently put into effect by his company. He stated that independent retail druggists provide nearly the entire volume of wholesalers' business, and that toilet goods require more promotional effort than other types of merchandise.

A list of suggestions for better distribution of toiletries and cosmetics through wholesale distribution channels was made by Mr. Lipscomb. Included were promotional and sales helps that are simple enough for the average consumer and clerk to understand, having one executive with experience in wholesaling to deal with wholesalers; more product knowledge for both wholesalers and retailers; allotment of space in retail drug stores on the basis of percentage of sales done by the particular type of merchandise; not slipping in "sleepers" (new or unsuccessful products) when setting up promotions and deals.

The problems of the independent druggist were discussed by Zachary Druss, of Druss-Roemer, Inc., White Plains, New York.

COMPLETION of one third of the work on the critical review of the literature of some 1,200 substances used in the industry, the names of which were submitted by various associated industries, was announced by Howard W. Haggard, M. D., director of the laboratory of applied physiology, Yale University. The work was undertaken as part of the industry's research program. The object of the review is to determine the extent of current knowledge on these substances, particularly as to their action on the skin, mucous membranes and eyes, and their general toxicity, Dr. Haggard pointed out.

Following a discussion of labor relations in the toilet goods and cosmetic industry, by John P. Currie of Currie & Gherman, which concluded the Wednesday morning session, television was discussed and demonstrated at the group luncheon by George W. Wallace, television promotion manager of the National Broadcasting Co., New York.

The morning and afternoon sessions on Thursday, May 20, were given over to a series of technical papers, one of which "Non-Ionic Detergents" by George E. Barker, Atlas Powder Co., Wilmington, appears elsewhere in this issue. Another paper of specific interest to soap makers was "Methods of Testing Irritant Properties of Soaps Upon the Skin" by J. A. Killian and M. E. Marsh, of Killian Research Laboratories, Inc. The authors point out that in spite of the extremely widespread use of soap, relatively few reports of deleterious effects of soap upon the human skin have been noted. An occasional example occurs where an unusually hypersensitive skin offers an allergic response to soap. There are other cases as well where soaps may produce irritant effects on apparently normal skins.

The soap manufacturer, say the authors, is helpless in the matter of reducing the incidence of hypersensitivity to his soaps beyond eliminating from them non-soap ingredients such as some builders and perfumes, which have been found to be common eczemartizing agents. He can, however, and should cut down the variety and frequency of irritant effects of his products on the average normal skin to a minimum compatible with optimum detergency.

The authors describe the development of a patch method for testing the comparative irritant effects, or conversely, the mildness of various soaps. Results of an extensive series of experiments on large groups of human subjects are reported and discussed as illustrative examples of optimum conditions for carrying out tests by the suggested method. The article will be published in full along with others presented at this session in the proceedings of the convention.

Wednesday afternoon was given over to a closed meeting for manufacturers only, the installation of new offices, new business, and a joint meeting between the boards of directors of the Canadian and U. S. toilet goods associations.

Identification of Cleaner Ingredients

By A. Treffler

Simple, rapid tests help to indicate the makeup of many commercial alkali cleaners. They save the analyst time and avoid many difficulties.

THE analysis of cleaners containing soaps, synthetic detergents, alkalies and water softeners is often beset with difficulties. The beginner, and even the expert, may be delayed more than he expects in getting correct results. Each laboratory has its own bag of tricks helpful in making rapid qualitative estimates. With a little refinement and development some of these tricks have finally emerged as full-fledged quantitative methods to become accepted as standards. On the other hand, others have inherent weaknesses, are of limited value, and demand considerable experience for proper interpretation.

Among the preliminary qualitative tests that might be run on an alkali cleaner is a microscopic examination which gets results quickly. The characteristic crystalline forms of trisodium phosphate, sodium sesuicarbonate, and other alkalies are seldom misleading. The difficult determination of boric acid and borax, the identification of orthophosphates from pyro-or metaphosphates, of alkali soaps and synthetic detergents and other ingredients in such mixtures can be simplified by new procedures.

The possibility of the presence of soap in a sample is indicated when the sample, shaken with a little water, forms suds. By acidifying the solution with a little hydrochloric, sulfuric or acetic acid, the presence of either soap or synthetic detergent may be indicated. The alkali soaps split off fatty acids in the presence of an acid and the lather disappears. Many common forms of synthetic detergents do not decompose in acids and their lather is still apparent. Furthermore, the presence of carbonates and silicates may be indicated when the acid is added to the sample in water method, the evolution of carbon dioxide pointing out the presence of carbonate and the appearance of gelatinous silicic acid indicating silicates. If a portion of the aqueous solution is acidified with nitric acid and heated for five minutes, cooled and separated by filtration from any fatty and silicic acid, phosphates can be detected by precipitation with ammonium molybdate solution.

The presence of boric acid can be affirmed by the usual flame test, using platinum wire, sulfuric acid and glycerin. In alkali mixtures with varying particle sizes, the use of a set of sieves with meshes from 20 to 100 often allows a mechanical separation of the component alkalies and their approximate percentage estimation.

Identifying Phosphates

A NOVEL colorimetric distinction of pyrophosphates and metaphosphates from orthophosphates and other alkalies is effected by the use of tannic acid. The tannic acid reagent is prepared by dissolving five percent tannic acid (U.S.P. or C.P.) in distilled water. A heavy, absorbent filter paper is saturated with the reagent, and laid upon a waxed paper. The different alkali particles are placed on the saturated paper with tweezers or spread over the paper by means of a sieve. Each alkali reacts with the tannic acid reagent to form a different shade of color ranging from light yellow to deep brown. Pyro-and metaphosphates, as distint from orthophosphates, produce a typical rose tint, not developed by any other alkali. The same observation can be made in neutral liquid soaps, containing such phosphates by adding a little five percent tannic acid solution. If the color development on the filter paper is not clear enough, a few drops more of the reagent will help to bring out the color. The color of the reaction product is more distinct if the tannic acid solution is pure and colorless. Commercial, dark colored tannic acid cannot be used for making up this reagent. Tannic acid test paper may be prepared by saturating heavy grade filter paper with the reagent and allowing it to dry. The paper then is simply moistened as the test is made.

These colorimetric indications suggest the possible use of the electro-

ALKALIES	5% tannic acid solution reacted with alkalies in powder form	in solutions
Caustic Soda	brown	dark brown
Caustic Potash	brown	mohogany brown
Ortho and Metasilicate	brown	
Trisodiumphosphate	yellow-brown	
Disodiumphosphate	no reaction	
Phosphoric Acid	no reaction	
Tetrasodium pyrophosphate	rose	faint rose
Tetrapotassium pyrophosphate	rose	rose
Tripolyphosphate	rose	rose
Quadrafos	faint rose	deep rose
Metaphosphate	faint rose	deep rose
Sodium carbonate	yellow-brown	
Sodium bicarbonate	colorless	
Borax and boric acid		

photometer for making quantitative determinations. The different color reactions of the alkalies with tannic acid are shown in the table (page 43).

A Quantitative Procedure

AFTER such preliminary tests have proved the presence of several alkalies or alkali-soap mixtures, a quantitative analysis is often desired. The first step is the determination of the total moisture. The usual procedure consists in drying to constant weight a five to 10 gram sample at 105°C. in a drying oven. The loss in weight is the amount of free moisture providing there are no silicates or borates present. Soaps and synthetic detergents are extracted with concentrated methyl or ethyl alcohol, and the alcohol-insoluble alkalies and salts are removed by filtration and dried to constant weight. The difference in weight is the anhydrous soap, the synthetic detergent (active ingredient) and the neutral fats, if present. Pine oil usually evaporates completely if heated long enough.

If silicates or borates are found in the alkalies, a second heating in a crucible oven over an open flame will be necessary for the complete volatilization of the moisture. The additional loss of weight must be added to the first results of the drying oven moisture determination. Moisture determinations on alkali powders such as trisodium phosphate, borax and sesquicarbonate are as a rule within very close limits of the theoretical percentage, and in burn off tests give quick quantitative values. However, in the case of metasilicates and other alkalies, the results vary more from the theoretical value.

Of equal importance and help is the colorimetric or electrometric determination of the pH of 0.1 percent solutions of the cleaner. Since the pH of the various alkalies is a fixed value for a given concentration and temperature, its determination on a single alkali saves the bother of a titration with standard acid or other identification.

An additional test, quick and easy to run off and offering more accurate quantitative information on the alkalies present, is the well-known double titration of carbonate-bicarbonate mixtures with the use of the indicators phenolphthalein and methyl orange. Sodium carbonate is converted to the bicarbonate when titrated with a standard solution of acid to an end-point as indicated by phenolphthalein. The milliliters of acid used multiplied by two represents the total alkalinity, in terms of Na_2O, due to the carbonate. If the titration with the acid is now continued to the end-point as indicated by methyl orange indicator color change, all of the bicarbonate is neutralized. If this second titration is greater than the first one, some sodium bicarbonate was present in the original sample and its amount can be calculated from this excess. The Na_2O content of borax and metasilicate, if not in mixtures, can be determined also by titration with standard acids and methyl orange. If borax is present in combination with sodium carbonate and bicarbonate, it can be calculated from its boric acid equivalent, found by back-titrating the solution from the carbonate titration with glycerine and phenolphthalein indicator after boiling it free of carbon dioxide. However, if silica and phosphoric acid are present in the solution, another method of determining borax must be used.

Borax and Phosphates

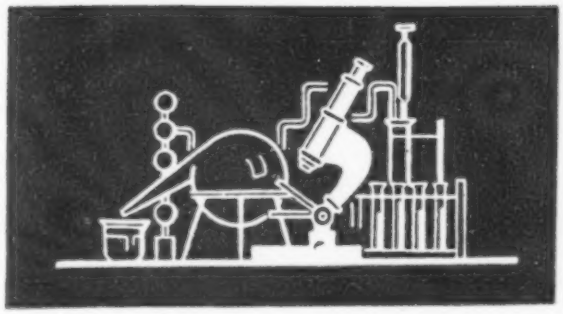
THE total amount of Na_2O can be determined also by treating the alkalies with acid and converting them in a crucible over an open flame into sodium chloride or better into sodium sulfate and volatilizing away the phosphoric acid and oxides of boron and silicon. The phosphoric acid is converted at red heat to metaphosphoric acid and as such is sublimed. The first-mentioned oxide is removed by moistening the salt several times with glycerine and burning it off until the green color in the flame disappears. The silica may be removed by placing the residue in a platinum crucible, adding a little hydrofluoric acid and volatilizing away the resulting silicon tetrafluoride at lower temperatures. The silica can also be filtered from the dissolved molten residue should there be no platinum ware available. The writer has made several borax and phosphoric acid determinations by these methods and has found them worth discussion.

A sample of alkali containing not more than 0.1 gm. of borax in the form of B_2O_3 and any amount of ortho-, pyro-- or metaphosphate, is weighed out in a small flat silica or porcelain dish, heated over an open flame until completely anhydrous, and weighed. The somewhat cooled sample is moistened with concentrated sufuric acid or hydrochloric acid and heated over a Bunsen flame until all excess of acid is volatilized. Orthophosphoric acid gradually changes thereby to pyrophosphoric and finally to metaphosphoric acid and volatilizes. The procedure of moistening the molten mass with acid and heating is repeated until a constant weight is obtained. This treatment removes the phosphates.

The next step is to remove the borax. The sample is moistened with glycerine and burned off repeatedly until there is no longer any evidence of green color in the flame. The glycerine is applied best with a stirring rod to the wall of the somewhat cooled crucible. Any carbon residue in the crucible is destroyed by adding a few drops of concentrated nitric acid and heating until a constant weight is obtained. If the weight of the chloride or sulfate residue is constant, the amount of phosphoric acid and B_2O_3 can be calculated from the three weights obtained from the procedure just described. From the B_2O_3 content, the weight of the anhydrous borax can be calculated. This weight subtracted from the first weight establishes the weight of the anhydrous phosphate. From the weight of the sodium chloride or sulfate residue and the anhydrous borax the amount of Na_2O combined with P_2O_5 can be calculated by difference, and from this result the P_2O_5 is taken by difference, if the ammonium phosphomolybdate method should not be preferred as the less abstract.

A Test for Carbonate

SODIUM carbonate, or soda ash, the lowest priced alkali, is used in combination with sodium bicarbonate to a great extent in cleaners, and its quick estimation by a simple test is of



importance. The evolution of carbon dioxide gas and its estimation by loss of weight is a satisfactory method. The apparatus used is a Schroetter's or Mohr's alkalimeter. The material to be analyzed is placed in the flask of the apparatus and dilute (1:1) hydrochloric acid is admitted from the separatory funnel portion. The gas passes out through the condenser where the moisture is either refluxed or absorbed. The apparatus is placed on the pan of an analytical balance and weighed before and after the gas is evolved.

A high percentage of sodium carbonate, in distinction from sodium bicarbonate, can be detected by moistening about one gram of the anhydrous powder on the palm of the hand with a few drops of water and observing the resulting heat of reaction. Anhydrous tetrasodium pyrophosphate and anhydrous tripolyphosphate however give the same reaction.

Evaluating Detergency

THE complete analysis of soap powders and alkali mixtures containing a number of ingredients is often too time-consuming and is frequently unnecessary when an evaluation of detergency is all that is needed. Many users of such products are completely satisfied knowing how much more or less of the newly appraised product is necessary for a certain application in comparison with some comparative product. This can often be determined by running a suds stability test in comparison with the product of known performance. For such estimations, the known and unknown products are made up in one per cent solutions, and 58.3 mls. of water of a certain degree of hardness, and in a four ounce bottle, are titrated with the solution until the suds in the bottle has, upon shaking, a stability of five minutes. The milliliters of titrant needed to obtain this end point can be regarded as a measure of the detergent value of the product at the temperature of the test.

The Airotitrator

A QUICKER and more accurate procedure is the use of the Airotitrator, a 2½ inch wide and 5¼ inch high glass cylinder. This is filled with 50 mls. of 10 grain (U.S.) hard water through which filtered air from an air compressor is bubbled at a regulated speed. The one per cent solution of the cleaner to be tested is slowly run in from a burette until the hardness of the water is overcome and the suds on the surface rise to a certain point on the cylinder about 2½ inches above the liquid level and stay there for at least one minute. The milliliters of titrant are again a measure of detergency. When testing alkali mixtures that contain no soap, a sudsing factor should be added. The sudsing factor is the number of milliliters of a standard soap solution necessary to bring fifty mls. of pure distilled water, at the same temperature, to the sudsing point This method gives satisfactory results on cleaners, compounded with alkalies and alkali soaps, but cannot be used on synthetic detergents without modification.

Emulsifying Power

FATTY acids have a high affinity for mineral oils, metallic soaps, dyestuffs, carbon black and like soils. The soaps of these fatty acids therefore are excellent emulsifing agents for such impurities. This is not the case with the types of synthetic detergents having no fatty acid radicals and having a short hydrophobic group and a powerful hydrophilic group in their molecular structures. Even coconut oil soap, which has a comparatively short hydrophobic group, does not form emulsions of good stability with mineral oil and water.

Molecular adhesion is found most developed in the long chain hydrocarbon groups, sixteen carbon atoms and above, and changes in the physical appearance of liquid hydrocarbons, such as kerosene, to solids, such as paraffin wax, seem to be related to the magnetic field formed by the uniform line-up of electrons rotating in the same direction. The strength of this magnetic field is now known to increase with increasing line-up of the electrons. This molecular adhesion is said to be the basic principle for the formation of oil-in-water or water-in-oil emulsions, the formation of micelles and crystallites, the compatibility of synthetic detergents with alkali soaps, and their ability to emulsify metallic soaps and mineral oil. A cleaner for oil and grease therefore should have an alkali soap or a synthetic detergent with a long hydrocarbon group or at least a long hydrophobic group.

Evaluation of Synthetics

THE ability of a synthetic detergent to emulsify oil and grease soil can be established by the airotitration test. Fifty mls. of ten grain (U.S.) hard water in the airotitrator, are titrated to permanent lather with a one percent aqueous solution of potassium oleate. The synthetic detergent or soap solution to be tested is made up in a one per cent alcoholic solution. The airotitrator, is once more filled with 50 mls. of 10 grain hard water and only half of the one percent potassium oleate necessary for producing a permanent lather is added. At this point it must be assumed that the calcium, magnesium and iron soaps formed are still in the pure state, i.e., as simple molecules unassociated in complexes with peptizing potassium oleate. Any soap with a long hydrocarbon or hydrophobic chain or group and a high affinity for oleic acid will enclose the metallic soaps easily in micelles, solubilize them, and once more produce a permanent lather.

By titrating some 10 or 20 synthetic detergents commonly used on the market and comparing their titration in each case with the struc-

(*Turn to Page* 159)

NON-IONIC DETERGENTS

By George E. Barker, Ph.D.*

SYNTHETIC organic detergents have been commercially available for about twenty years and during this period have grown from a position of insignificance to one of major importance involving the production of 600,000,000 to 700,000,000 pounds (estimated) in 1947. In spite of the large number of trade-named products now on the market, and the number is increasing constantly, there are a relatively few chemical types.

Detergents are a class of a broader group of materials generally designated as surface active agents.[1,2] These particular materials derive their name and their importance from their ability to modify the properties of surfaces. In the case of detergents it is their ability to alter the surface properties of water and other liquids. Naturally, their solutions also change the properties of the surfaces of solids with which they come into contact.

The ability to display surface activity is closely connected with chemical composition. All compounds which show surface activity in aqueous (water) systems must contain a hydrophilic, or water-loving portion and a lipophilic, or oil-loving portion. The hydrophilic part of the molecule may be: for example, carboxylate, sulfate, sulfonate, polyhydric alcohol or alcohol-ether. The lipophilic portion of the molecule may be a long hydrocarbon chain, as in the fatty acids, or a cyclic hydrocarbon, or a combination of the two. Soap may be represented by the following formula:

$CH_3CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_2COONa$, in which the hydrocarbon chain is the lipophilic group and the —COONa is the hydrophilic group. There is a tendency for the surface active agent or detergent to concentrate at the surface or interface and in this way exhibit its characteristic effects. It has been shown that these substances orient themselves in a definite pattern, and it is believed that such orientation or arrangement has a considerable influence on the properties of the solutions. Suffice it to say that the water-soluble portion of the molecule dissolves in the water and the oil-soluble portion dissolves in the oil or attaches itself to lipophilic surfaces.

Although there are in the neighborhood of 400 trade-named synthetic surface agents, of which possibly 200 are detergents of a sort, there are only three types: the anionics, the cationics, and the non-ionics. The anionics are those surface active products which ionize in solution to give an organic anion. Examples are the sodium alcohol sulfates, the sodium alkylaryl sulfonates, and the sodium alkyl sulfonates. The cationics are those products which ionize in solution to give an organic cation. These products, although they show detergent properties, have found principal application as germicides. Examples are the quaternary salts, such as cetyl dimethyl benzyl ammonium bromide. The non-ionics are those products which do not ionize in solution, and are the most recent to find application as commercial detergents.

The non-ionic detergents are generally liquids or soft waxy solids which are chemically polyoxyethylene (hydrophilic portion of the molecule) derivatives. The lipophilic portion of the molecule is derived from a wide variety of chemical classes including fatty acids, alcohols, thioalcohols, alkylphenols, and sorbitol and sorbitan esters containing at least one free hydrozyl group. Recently a method has been devised for converting non-ionics to solid completely organic compounds, which may permit the development of a whole series of products with cosmetic appeal, including synthetic bar detergents.

The Atlas Powder Company produces a wide range of non-ionic emulsifiers and detergents. Because of my close association with the development of some of these products and familiarity with their properties, I shall draw heavily on them for examples. Many manufacturers of toilet preparations are familiar with the Atlas non-ionic emulsifiers for use in the preparation of cosmetic items.[4] It was a logical step to make certain necessary adjustments in the balance between the lipophilic and hydrophilic portions of some of these molecules to obtain detergents. As a result of such research, a group of non-ionic detergents was developed.

The non-ionics possess certain peculiar characteristics which are unique with their class. In general their solubility decreases as the temperature is raised. They are compatible with water of any hardness, and even with sea water, without any precipitation over a wide range of concentrations. They are generally non-irritating,[3] and many of them produce in water solution a pH of about 6.0 which is near that of normal human skin. Generally the non-ionics show less tendency to de-fat the skin and allow ready incorporation of emollients. Usually, non-ionics do not foam excessively, in fact, they are poor foamers. Obviously, foam is of psychological value. Many non-ionics increase the effective germicidal properties of some of the quaternary am-

*Before Toilet Goods Assn., New York, May 20, 1948.

TABLE I

Effect of Non-Ionic Detergents on the Detergency of Alkylaryl Sulfonates in Washing Standard Soiled Cotton at Low Concentrations

Concentration (per cent) in Hard Water (300 ppm)

Alkylaryl Sulfonate	Tween 80	G-7596J	Renex	Relative Detergency
0.035				44
0.035	0.00625			100
0.035		0.00625		75
0.035			0.00625	97

TABLE II

Effect of Non-Ionic Detergents on the Detergency of Alkylaryl Sulfonates in Washing Standard Soiled Wool (Worsted) at Low Concentrations

Concentration (per cent) in Hard Water (300 ppm)

Alkylaryl Sulfonate	Tween 80	G-7596J	Renex	Relative Detergency
0.035				37
0.035	0.00625			100
0.035		0.00625		47
0.035			0.00625	98

monium compounds. The non-ionics include the best synthetic detergents for cotton washing now on the market.

Required Properties of Effective Detergents

MANY factors are involved in the action of detergents. The assisted removal of dirt or soil from surfaces as typified by washing with an aqueous solution of a detergent is a complex procedure. A brief review of the probable mode of action of detergent solutions would include the following list of influential factors:

1. *Decreasing the interfacial tension between the surface and the detergent solution.*

This condition is fundamental and generally exists wherever detergents are employed effectively. It simply means that the soil is wet by the detergent solution. This factor is studied in the laboratory by means of determining surface tensions, interfacial tensions, and wetting properties.

2. *Solubilizing soil in the detergent solution.*

This factor is not always involved in detergency but it is important with certain types of soil, particularly in the removal of some stains.

3. *Emulsifying and deflocculating the soil in the detergent solution.*

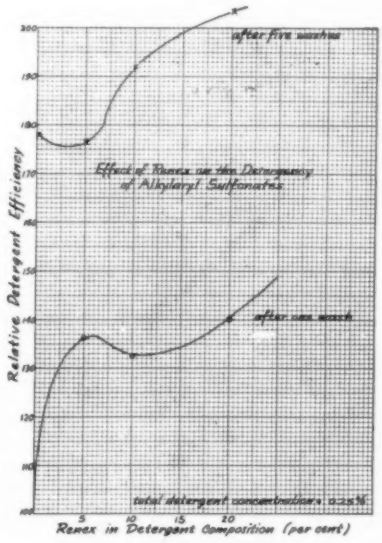
These phenomena occur in practically all types of cleaning operations. Oils, greases, and wax-like materials are emulsified to form semi-stable dispersions. At the same time, the insoluble solid particles are dispersed in the detergent solution.

4. *Preventing the redeposition of the soil by the detergent solution.*

This is one of the most important functions of a detergent in all cleaning operations. It means that the dispersion of the soil is sufficiently stable to permit removal in rinsing. If the redeposition of the soil is not prevented by the detergent, all that is accomplished by the washing operation is a redistribution of the soil.

Effect of Non-Ionic Detergents on the Detergency of the Anionics

IT has been discovered that non-ionic detergents increase greatly the detergency of various anionic detergents, particularly at low concentrations. In addition, many non-ionics increase the solubility of the anionics at low temperatures, and in hard water. These phenomena may be illustrated by some data showing the effects of three non-ionics on the detergency of alkylaryl sulfonates. In Tables I and II are presented some results showing the effect of adding Tween 80, G-7596J, or Renex to a typical alkylaryl sulfonate at very low concentration. Inspection of the tables shows that the addition of approximately 18 per cent of either Tween 80 or Renex to the alkylaryl sulfonate more than doubles the detergency on cotton and on wool.



At higher total detergent concentrations the addition of non-ionic detergents to the alkylaryl sulfonates have a less, although considerable effect on the detergency of alkylaryl sulfonates. The accompanying graph illustrates the effect.

Likewise, even when built with alkalis, some non-ionics continue to increase the detergency of the alkylaryl sulfonates. This effect is further illustrated by the data in Table III.

Applications of Non-Ionic Detergents

THE non-ionic surface active agents are the newest to find applications as commercial detergents. Some of the fields in which they are finding increasing use are:

1. Commercial laundering.
2. Textile scouring.

TABLE III

Effect of Non-Ionic Detergents on the Detergency of Built Alkylaryl Sulfonates in Washing of Standard Soiled Cotton

Composition	Concentration (per cent)	Relative Detergency
Alkylaryl sulfonates	0.25	100
21% alkylaryl sulfonates	0.25	117
1% sodium carboxymethyl cellulose (low visc.)		
9% water		
15% tetrasodium pyrophosphate		
54% sodium sulfate (anhydrous)		
10% alkylaryl sulfonates	0.25	168
10% Renex (a non-ionic detergent)		
1% sodium carboxymethyl cellulose (low visc.)		
9% water		
15% tetrasodium pyrophosphate		
55% sodium sulfate (anhydrous)		

3. Compounding built detergents for home laundering.
4. Compounding dry cleaning detergents and spotting agents.
5. Wet cleaning.
6. Dish and bottle washing.
7. Rug cleaning.
8. Compounding specialty cleaners.

It is the last field of application which is presumably of most interest to this group, so it is the only one which will be considered in some detail. The discussion will be subdivided according to the specific applications.

A. *Skin Cleansers*

Non-ionic detergents may be used to considerable advantage in the formulation of skin cleansers. Their high detergency and non-irritating character combine to give high quality products.

1. *Hand Cleaners*

A heavy duty mechanic's hand cleaner may be formulated as follows:

a. 15 per cent Renex
10 per cent water
10 per cent tetrasodium pyrophosphate
65 per cent sodium sulfate (anhydrous)

Another heavy duty hand cleaner which may be used follows:

b. 15 per cent Renex
10 per cent water
20 per cent sodium tetraborate
15 per cent sodium sulfate
40 per cent abrasive (corn meal, clay, etc.)

Many now prefer an emulsion type of hand cleaner which is employed by application to the hands, rubbing to loosen the grease and grime, and removing by rinsing with water. A typical formula follows:

c. 60 per cent light mineral oil (Marcol GX)
22 per cent kerosene (deodorized)
12 per cent Tween 85
3 per cent G-7626Y
3 per cent lanolin

Another interesting type of hand cleaner is the so-called "waterless" cleaner, which does not require additional water for use. The cleaner, a cream, is rubbed onto the hands to loosen the soil, and wiped off with a towel or handkerchief, leaving the skin clean and soft. An interesting property of this product is that the towel, scarf, etc., which is used to wipe off the soil needs only to be rinsed in cold water to be restored to its original cleanliness. The formula follows:

d. 6.25 per cent Renex or Tween 80
1.25 per cent Arlacel C
0.02 per cent Dowicide B (Preservative)
2.50 per cent sodium carboxymethyl cellulose
89.98 per cent water.

2. *Shampoos*

Non-ionic detergents because of their non-irritating character make particularly interesting shampoos. A novel product developed along this line is a foamless shampoo which shows excellent cleaning action, and leaves the hair and scalp in good condition. A formula follows:

20 per cent Tween 80 or Renex
5 per cent Lanolin
1 per cent Arlacel C
2 per cent sodium carboxymethyl cellulose (high visc.)
72 per cent water
q.s. preservative, perfume, etc.

It is necessary to use a preservative in this formulation. The oils are melted together and added to the CMC-water gel with vigorous stirring. The viscosity may be varied by selection of the type and quantity of CMC used.

An antiseptic type of shampoo may be prepared by blending a quaternary ammonium salt and a non-ionic detergent. A typical formula is given here:

4 per cent Renex (non-ionic)
12 per cent cetyl benzyl dimethyl ammonium bromide
84 per cent water
q.s. perfume

Non-ionic detergents may be employed to advantage in shampoo based on alkylaryl sulfonates or alkyl sulfonates to improve their solubility in water at low temperatures and to improve their cleansing powers. An example follows:

4 per cent Tween 80
16 per cent alkyl sulfonate or alkylaryl sulfonate
80 per cent water
q.s. preservative, perfume, coloring, etc.

Another interesting and somewhat unusual product which is possible because of the compatibility of non-ionic detergents with a wide variety of materials is an insecticidal animal shampoo. An example is given in the following formula:

20 per cent Renex or Tween 80 (non-ionic)
10 per cent Atlas Insecticide NNOR (non-ionic)
3 per cent DDT
2 per cent sodium carboxymethyl cellulose (high visc.)
65 per cent water

The DDT is dissolved in the oils, and the CMC is dissolved in the water. The aqueous and non-aqueous solutions are mixed with vigorous agitation.

Conclusions

Let us conclude this discussion by summarizing the most outstanding

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WHALE OIL

By John R. Skeen
Market Research Dept.
Foster D. Snell, Inc.

OF the marine mammal oils whale oil is of greatest economic importance. The cessation of production in the Antarctic was a major contributory factor in the world-wide shortage of fats and oils that developed as a result of the war. Before 1940, the world supply of whale oil amounted to about 1.2 billion pounds annually; in war years, this was reduced to 85 million pounds. The industry became active again in 1946 and is presently operating at about half the pre-war rate.

Whale oil is used abroad mostly in margarine and shortening. The domestic outlet is "normally" soap almost exclusively, representing three percent of all fats and oils so consumed. Since 1942, practically none has been available to the soap maker and the future position of whale oil in this industry is at present obscure.

Oils from seal and porpoise are a negligible component of marine mammal oils. Of the totals given in the table, whale oils represent upwards of 98 percent for all years. A commercial distinction is made between sperm and "all other" whale oil, more simply, "whale" oil as contrasted with sperm. Sperm oil is composed of liquid waxes while whale oil is a fat.

Sperm oil absorbs little oxygen, is not influenced by temperature variations and is characterized by freedom from gumming. Until the twentieth century, the crude was used as a fine lubricant for clocks and watches, and for burning in lamps. For a time, little industrial application was found. It was, however, refined to obtain the wax or spermaceti consumed mostly in making cosmetics and, to some extent, in candles. The war developed other uses: lubricant for new motors and motors subject to temperature extremes, additive for making pressure greases, cutting oils, textile and leather finishing agents, etc.

(*Turn to Page* 159)

MARINE MAMMAL OILS: A STATISTICAL SUMMARY
Unit: 1000 pounds

	Marine Mamal Oils—Crude Basis [1]								
	Apparent Disappearance [2]	*Consumption Factory*		*New Supply*		*Exports*	*Stocks Period End* [8]	*Price—¢/#*	
		Total [3]	*Soap* [4]	*Production* [5]	*Imports* [6]	*Total* [7]		*Whale Oil* [9]	*Sperm Oil* [10]
1934	5,753	35,207	33,996	8,550	19,990		61,656	7.3	—
5	56,696	30,963	28,440	10,072	23,073		38,105	8.0	8.8
6	58,220	35,388	32,603	31,340	28,096		39,321	7.8	8.5
7	72,203	70,196	65,130	69,417	54,771		91,306	10.3	8.9
8	89,386	70,664	66,080	58,281	22,072		82,273	9.1	8.9
9	71,278	58,650	51,522	25,939	20,289	12,720	44,503	8.5	8.3
40	33,267	26,885	19,250	19,709	22,257	—	53,202	9.5	9.5
1	27,555	18,097	6,889	351	7,330	—	33,328	10.3	10.8
2	19,930	30,385	12,403	296	46,086	221	59,559	11.1	12.2
3	25,310	17,839	284	281	62,802	29,646	67,686	11.9	12.8
4	23,091	16,197	9	300	4,093	3,289	45,699	12.3	13.1
5	14,664	15,607	2	—	2,057	13,302	19,790	12.3	13.1
6	14,174	13,025	4	—	1,011	1,958	4,669	12.3	13.1
7	70	21,249	10	137	14,934	966	18,704	[11]	26.9
1948					m. a.	m. a.	11,257	[11]	25.7
1Q		8,300	m. a.	—					

NOTES.

1 includes these oils: whale, sperm, seal, porpoise; the new supply of sperm oil probably did not exceed 3.2 million pounds (4%) before 1941 and the remainder was almost entirely whale oil; in later years the proportion of sperm oil to the total consumed may have increased to 25%.

2 new supply less exports plus change in stocks

3 1934-38, *Animal & Vegetable Fats & Oils*, Department of Commerce, 1939; 1939-43, ibid, 1944; 1944-46, *Facts for Industry*, series M17-7-06; 1947, ibid, series M17-2(-1,-2,-3,-4).

4 1934-38, *Animal & Vegetable Fats & Oils*, 1939; 1938, a revised figure; 1939-42, ibid, 1944; 1943-46, Facts for Industry, series M17-7-06; 1947, ibid, loc. cit.

5 1934-37, *Animal & Vegetable Fats & Oils*, 1939; 1938 a revised figure; 1939-42, revised data, courtesy Mrs. A. M. Goldsmith, Fats and Oils Section, Department of Commerce; 1943-46, *Facts for Industry*, series M17-7-06; 1947, ibid, series M17-1.

6 Whale oil only, compiled by Bureau of Foreign & Domestic Commerce; 1939-40, ibid, 1941-46, recent compilation courtesy Mrs. A. M. Goldsmith, loc. cit.

7 Exports and re-exports, not separately reported 1934-38 and included with "other fish oils"; published data 1939—, including whale oil, do not constitute a continuous series; values reported here represent a special compilation, courtesy Mrs. A. M. Goldsmith, loc. cit.

8 1934-38, *Animal & Vegetable Fats & Oils*, 1939, Compiled by Bureau of Foreign & Domestic Commerce; 1940-43, ibid, 1944; 1939 revised data; 1944-46, *Facts for Industry*, series M17-7-06; 1947, ibid, series M17-1.

9 refined, bleached, drums, N. Y.: *The Fats & Oils Situation*, Department of Agricutlure.

10 natural 45°, drums, N. Y.; ibid.

11 no quotations.

TRADE NEWS. . . .

C-P-P Advances Railey

B. W. Railey, since 1938 a director and vice-president in charge of western operations with head

B. W. RAILEY

quarters in Berkeley, Calif., was elected executive vice-president of Colgate-Palmolive-Peet Co., Jersey City, N.J. at the company's recent annual meeting of the board. Mr. Railey began his career with Peet Brothers Co., Kansas City. He has held many responsible positions with the company. He will make his headquarters in the Jersey City, N. J., offices of the company.

Safeway Buys Par Soap

Par Soap Co. of Oakland, Calif., has recently been purchased by Safeway Stores, Inc., Oakland, Safeway is reported planning to operate the soap company as a separate corporation. Par Soap Co. had 4975½ shares of common stock outstanding and these were all purchased by Safeway.

Pleads on Fat Use

Charged with using more than his quota of fats and oils in the manufacture of soap during the war, Samuel Halaby of the Rochester, N. Y. firm bearing his name entered a plea of nolo contendere, which was accepted by U. S. District Judge Harold P. Burke in Rochester, recently. The defendant said he would not contest Government charges brought in two informations filed against him, individually, and his company, Samuel Halaby, Inc., that he had violated War Food Order 42b in the period Jan. 1, 1944 to Apr. 1, 1946.

Drew, Gamber Join Lever

Lever Brothers Co., Cambridge, Mass., have named J. E. Drew and Gerald F. Gamber as associate directors of public relations and personnel, respectively, Thomas A. Gonser, director of personnel and public relations, reported late in May. Both men make their headquarters at Lever House in Cambridge. For the past two years Mr. Drew has been with the National Association of Manufacturers in public relations work. Mr. Gamber was industrial relations director with the Crosley Division of the AVCI Manufacturing Corp., Cincinnati, from 1944 until his present appointment with Lever Brothers.

Gillam Runs for Congress

Ernest O. Gillam, head of Gillam Soap Works, Fort Worth, Tex., is again a nominee for the House of Representatives from the 12th district of Texas. He ran for election in 1946 making a very creditable showing, and is reported to have an improved chance of being elected as the representative of his district in the coming November elections.

BIMS Set Golf Dates

The BIMS of New York have just announced their golf tournament schedule for 1948. The opener is being held June 22 at Baltusrol, N. J. No tourney is set for July, but two will be held in August. The first on August 10, at Winged Foot Country Club, and the second at Wheatley Hills, Long Island.

A.I.C. Elects Flett

Lawrence H. Flett, director of the new products division of National Aniline Division of Allied

LAWRENCE H. FLETT

Chemical & Dye Corp., New York, was elected president of the American Institute of Chemists during May. For the past year Mr. Flett, who succeeds Foster D. Snell of the New York research laboratory bearing his name, has served as chairman of the New York chapter of the A.I.C. Dr. Raymon Kirk, dean of the graduate school and head of the department of chemistry of Polytechnic Institute of Brooklyn, was elected vice-president of the Institute.

At a meeting held jointly, May 8 with the New York section of the American Chemical Society at the Waldorf-Astoria hotel New York, the American Institute of Chemists presented its gold medal to Dr. Charles Allen Thomas, executive vice-president of Monsanto Chemical Co., St. Louis, and president of the American Chemical Society.

Leaves P&G for Agency

E. L. Hill, formerly with the advertising department of Procter & Gamble Co., Cincinnati, has joined Ted Bates, Inc., New York advertising agency, as account executive.

you don't have to stand on your head!

Looking for a perfume with a clean outdoor scent, fresh as a breeze?...with great versatility so that it may be adapted for many uses?...with maximum effusion and minimum cost? Don't stand on your head or go through unnecessary gymnastics to figure how and where you may get it.

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FORESTINE

- **FORESTINE** is reminiscent of a Swiss Pine fragrance.
- **FORESTINE** is ideal for Laundry Soaps, Washing Powders, Detergents, Liquid Cleansers, Polishes, Waxes, etc.
- **FORESTINE** has high odoriferous value and great effusion.
- **FORESTINE** is amazingly economical.
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W. Phillips, Lever Head Perfumer, Retires

WILLIAM PHILLIPS

WILLIAM Phillips, chief supervisor of perfume research, Lever Brothers Co., Cambridge, Mass., retired from the firm, effective June 1. Mr. Phillips, having reached the compulsory retirement age, is succeeded by his assistant, Everett D. Kilmer, who has been with the company since 1931.

On his retirement, following an interval for rest, Mr. Phillips intends to go into business as a consultant to the perfume, cosmetic and allied industries. He has set up a laboratory at his residence in Belmont, Mass., as his headquarters, and will operate the business under the name Belmont Perfume Laboratory.

Mr. Phillips began his career at 14, as an apprentice to a pharmaceutical chemist in a small English town. After studying evenings, during which time he served a five-year apprenticeship, he became a qualified chemist and druggist. He then took a position in two of London's leading pharmacies, one of which held the Royal warrant, "By Appointment of their Majesties, the King and Queen," and regularly supplied goods to the royal family. Later he joined a wholesale druggist's sundries firm where he started and successfully operated a packaged pharmaceuticals and toilet goods department.

From this position, Mr. Phillips went with Lever Brothers at Port Sunlight in 1915. Five years later he was sent to Boston for the company, where he worked on the development of a complete line of toilet goods. Preparations for launching the line had been made, but the deflationary period of 1920 cancelled plans for producing the line. Mr. Phillips worked on the development of new Lever products, including "Lux" toilet soap and other milled soaps. As the company's perfumer, he was responsible for the formulation and quality control of all perfumes and pefumery materials. In addition, he did extensive research on all types of toilet goods. When Lever Brothers entered the cosmetic field through the acquisition of Pepsodent and Harriet Hubbard Ayer, Mr. Phillips was named chief supervisor of the perfume and toilet goods section of the research department.

A farewell dinner in honor of Mr. Phillips and George R. Folland, chief supervisor of research in the soap and oil handling section, who is also retiring, was given May 27. Mr. Folland had been with Lever Brothers since 1925, having previously been with N. K. Fairbanks Co. from 1900 until 1922.

Mr. Phillips' successor, Everett D. Kilmer is 39 years old and holds A.B. and A.M. degrees from Boston University. He joined Lever Brothers in 1931 and has been engaged in analytical, research, perfuming and control work, before being appointed to his present post.

Wins Safety Contest

Procter & Gamble Company's Macon, Ga. factory took top honors with a notable accident frequency rate of zero in a company-wide accident reduction contest for 1947. Second place award went to the Kansas City plant.

Peet Resigns from C-P-P

Roy W. Peet, vice-president of Colgate-Palmolive-Peet Co., Jersey City, N. J., resigned during May. In addition to his duties with Colgate-Palmolive-Peet Co., Mr. Peet was chairman of the American Fat Salvage

ROY W. PEET

Committee, Inc. Although his future plans are unannounced, he is reported to have bought a farm in southern New Jersey.

Monsanto Detergent Plant

Operation of a recently completed plant at Trenton, Mich., for the production of two non-ionic synthetic detergents by Monsanto Chemical Co., began June 1. The detergents being produced at the Trenton plant are "Sterox AW" and "Detergent MXP." The former is designed for use in automatic, home washing machines, because of its cleaning action and controlled suds. It is claimed to be as effective in hard as in soft water. "Detergent MXP" is used in industrial cleaning, textile processing, commercial power laundries and for mixing with other detergents to prevent dusting and improving performance, according to the company.

Ticknor Gillam Vice-Pres.

Arthur P. Ticknor, chemist and plant manager for Gillam Soap Works, Fort Worth, Tex. has been elected vice-president.

J. B. Williams Buys Skol

Gallowhur Chemical Corp., New York, disclosed late in May that it had sold its entire Skol business to J. B. Williams Co., Glastonbury, Conn.

Ralph E. Dorland Dies

Ralph E. Dorland, 68, for the past 30 years eastern general manager in New York for Dow Chemical Co.,

RALPH E. DORLAND

died suddenly of a stroke May 14. He was stricken at the Dow office at 10:30 a.m. and died at New York Hospital at 2:30 p.m.

Since 1946 Mr. Dorland had been president of the Synthetic Organic Chemical Manufacturers Association. He was one of the founders and twice president of the Chemical Salesmen's Association of the American Chemical Industry. He had served as president of the New York Board of Trade and chairman of the Drug, Chemical and Allied Trades Section of the organization.

"Doc," as he was familiarly known in the chemical and drug industries, was born in Elyria, O. He was graduated from Purdue University in 1901. A pharmacist, Mr. Dorland at one time operated his own drug store. He also taught in Green's School of Pharmacy in Indianapolis.

Surviving are his wife, the former Julia Reuter, and four sons; Grant A. Dorland of Lexington, Ky.; Wayne E. Dorland of MacNair-Dorland Co.; Jack A. Dorland, associated with Dow Chemical Co. in New York and Ralph E. Dorland, Jr. of San Francisco.

C-P-P Man Joins Squibb

Dr. Charles W. Deane, formerly head of the chemical engineering department of Colgate-Palmolive-Peet Co., Jersey City, N. J., was recently appointed chief engineer of E. R. Squibb & Sons, Brooklyn. He will make his headquarters at the Squibb plant in New Brunswick, N. J.

P & G Earnings Rise

An increased consolidated net profit of $66,270,466 as compared with $55,532,229 for a similar period a year ago, was reported for the nine months, ended Mar. 31, by Procter & Gamble Co., Cincinnati. More than half the amount, $34,000,000 was set aside for possible inventory price decline. The appropriation for reserve against declining prices of fats and oils in the period ended Mar. 31, 1947 totaled $29,500,000. Profit after inventory provision for the nine months ended Mar. 31, 1948 was $32,270,466 equal to $5.01 a common share. The 1947 net after inventory reserve was $26,032,229, or $4.04 a common share. Provisions for United States and foreign income taxes for the nine months just ended amounted to $39,000,000.

Heyworth Collegiate Head

Geoffrey Heyworth, chairman of Lever Brothers Unilever, Ltd., Cheshire, England, is the head of a recently begun administrative staff College at Henley-on-Thames for training business administrators to become senior executives. The college is sponsored by business men. The course runs for 21 weeks and 44 men are enrolled.

P & G Workers Union

Employees of the Procter & Gamble Co. manufacturing plant at Port Ivory, Staten Island, N. Y., recently elected an independent union as their bargaining agent. The vote favoring the independent union was 726 to 437. An American Federation of Labor union was also involved.

Set Up Tallow Plant

Operation of a plant for rendering tallow will be started shortly near Sprague ville, N. Y., in a re-equipped cheese plant. Company name for the new operation is St. Lawrence Soap Products, Inc., which will be operated by K. Haines and B. Olsen.

Buck Joins Ultra

Fred H. Buck, formerly president of Seaboard Distributors, Inc., Newark, N.J., was appointed indus-

FRED H. BUCK

trial sales manager of Ultra Chemical Works, Inc., Paterson, N. J., during May. Seaboard Distributors previously had acted as selling agent for Ultra. Mr. Buck's association with the chemical industry dates back to 1935 when he joined Merck & Co., Rahway, N.J., upon leaving Yale University.

Credit Men Hear Fello

Earl N. Fello, general manager and assistant treasurer of Colgate-Palmolive-Peet Co., Jersey City, N.J., recently addressed a meeting of the Triple Cities Association of Credit Men in Binghamton, N. Y. He discussed "Major Credit Problems of Today." Mr. Fello is a past president of the New York Credit Men's Association.

D & O Advances Dowling

The appointment of Arthur L. Dowling as assistant sales manager of Dodge & Olcott, Inc., New York, was announced during May. He joined the firm in 1946 and has been in charge of the De Laire perfume department. In his new post, Mr. Dowling will direct merchandise sales under Charles O. Homan, vice-president. Mr. Dowling served in the Navy in the recent war for six years, during which time he held the rank of lieutenant commander and was awarded the Navy Cross at Okinawa.

Soap Assn. Board Meets

Directors of the Association of American Soap & Glycerine Producers, Inc., meeting in New York, May 27, approved long considered amendments to the association's by-laws. Since the by-laws were first adopted 22 years ago, the association has grown from a relatively small membership of some 30 odd companies to approximately 200, and has built an increasingly important program of activities.

The by-law revisions are designed to give the industry an association in which each member, regardless of size and location, will have an equal voice in the formation of policy and an equal share in program participation. Each member is allowed one vote on any or all questions, elections, or whenever a vote by the membership is required.

The revised by-laws also provide for two classes of members: Active and Contributing Active. Active members are those admitted to membership who voluntarily elect to pay the association during the fiscal year a sum of $25 or more, but which in amount is less than a full pro-rata share, based on a scale determined by the board of directors. Contributing Active members are those who pay $25 or more, which in amount constitutes a full pro-rata share.

Soap at Safety Conference

Among exhibitors of soaps, sanitary maintenance supplies, protective creams and other products with a bearing on industrial plant safety and health at the 25th annual Midwest Safety Conference in Chicago last month, were the following: Lightfoot, Schultz & Co., New York; G. H. Packwood Mfg. Co., St. Louis, Mo.; The Peda Spray Co., New York; Walter G. Legge Co., New York; Diversey Corp., Chicago; Oil-Dri Corp. of America, Chicago; West Disinfecting Co., Long Island City, N. Y.; and John H. Breck, Inc., Springfield, Mass.

Outstanding accident reduction records made by the Hammond, Ind. plant of Lever Bros. Co. and Victor Chemical Works, Chicago, placed them among twenty-three winners of awards in an inter-plant safety contest, sponsored by the Greater Chicago Safety Council. Presentation of plaques attesting to their achievements was made at a banquet during the Chicago Safety gathering.

MARSHALL MUNDHEIM

Leaves Lightfoot Schultz

Marshall Mundheim, executive vice-president and director of Lightfoot Schultz Co., has just resigned from those posts. A director of the American Soap & Glycerine Producers Association, Mr. Mundheim has also given up that office. In addition, he has severed his connection as vice-president and director of Antoine de Paris, Inc., and Jacquet, Inc., both of New York. His future plans are unannounced.

Deupree Harvard Speaker

Richard R. Deupree, president of Procter & Gamble Co., Cincinnati, was to be one of the leading speakers at a conference held in Boston, June 12, under the auspices of the Harvard Business School Alumni Association. He was scheduled to discuss "Responsibilities to Workers."

Soap at Medical Meeting

Among the exhibitors at the 142nd annual meeting of the Medical Society of the state of New York, held at the Hotel Pennsylvania, New York, May 17-21, were the following soap companies: Procter & Gamble Co., Cincinnati; Stiefel Medicinal Soap Co., Preston Hollow, N. Y. and Swift & Co., Chicago.

USDA Fat, Oil Meeting

The Fats and Oils Branch, Production and Marketing Administration, U. S. Department of Agriculture, held a regular quarterly meeting of its industry advisory committee in Washington, June 3rd, for the purpose of reviewing and suggesting needed changes in its tentative estimates of fat and oil supplies. Following the meeting, and in the light of comments made on department estimates at the meeting, the Fats and Oils Branch was to prepare a final estimate to be used in determining the quantity of fats and oils that will be allocated for export in the third quarter.

Oil Export Procedure

Licensing procedure for distributing export quotas of fats and oils was discussed at a two-day meeting in Washington, May 25 and 26, by a 17 member committee drawn from the Fats and Oils Export Advisory Panel of the Office of International Trade. The "time-table" method of licensing, already adopted for iron and steel products, was approved by the committee as an improvement over existing procedures.

Other subjects of discussion were the operation of the various licensing criteria, the documentation which OIT should require with license applications, and methods of cutting down on the tremendous over-application for limited export quotas of fats and oils. In connection with the flood of export license applications for fats and oils, committee members suggested that each applicant should be required to fill out a Department of Commerce questionnaire to establish his status as an exporter.

Charles Lund of the OIT presided over the meeting. Among representatives of the soap trade attending were: F. H. Brady, Colgate-Palmolive-Peet Co., Donald F. Christy, Wilson & Co., Nils Dahl, John T. Stanley Co., A. P. Federline, Soap and Detergent Manufacturers Association, Robert P. Ivens, Cudahy Packing Co., and John J. O'Connor, Armour & Co.

Soap Sales Off

Deliveries of other than liquid soaps in terms of pounds and dollars declined sharply in the first quarter of 1948, as compared with the final three months of 1947, according to figures released recently by the Association of American Soap and Glycerine Producers, New York. Liquid soap shipments and their sales value reversed the trend and greater quantities, having a higher sales value were reported for the first quarter of this year, as against the final period of last year.

Total deliveries of solid soaps during the first three months of 1948 amounted to 657,911,104 pounds having a sales worth of $166,112,248. First quarter 1948 shipments were about 20 percent lower in poundage and 12 percent smaller in terms of dollars than in the previous quarter. The discrepancy between first quarter 1948 and the comparable period in 1947 shipments, however, is not as great as between the first period of this year and the final 1947 quarter. In the first three months of 1947, solid soap shipments were reported as 686,688,184 pounds, valued at $162,211,579. Although deliveries in the first 1947 quarter were larger than in the first three months of 1948, dollar volume in the latter period was greater. Approximately 68 manufacturers furnished figures.

Volume of liquid soap manufacture rose during the first 1948 quarter, reaching 755,606 gallons worth $992,029, as against 636,000 gallons valued at $809,000 for the final three months of 1947. The first quarter 1948 liquid soap total, however, was under the comparable 1947 period, when 967,655 gallons having a sales worth of $1,122,638 were reported.

Hugh Bartold Dies at 85

Hugo H. Bartold, director and vice-president of Norda Essential Oil & Chemical Co., New York, since 1925, died in St. Luke's Hospital, New York, May 8. He was 85. Mr. Bartold was in charge of the company's mid-western territory, and resided in Chicago for more than 50 years, all of which time was spent representing firms in the perfuming materials industry. He was a former president of the Chicago Soap and Perfume Association.

The new, completely redesigned package for "Quick Arrow" soap flakes, made by Swift & Co., Chicago, combines colors, size and package shape to denote quality, cleanliness and convenience. Color combinations are predominantly blue, with red and white for emphasis. Back panel introduces a technique of line drawings in streamlined motion to quickly explain uses of the product.

"Par-Busters" Set Dates

The first golf tournament of the 1948 season run by "Par-Busters," the joint golf auxiliary of the Chicago Perfumery, Soap & Extract Assn. and the Chicago Drug and Chemical Assn. was held at Medinah Country Club, May 25th. Other golf outings set for the remainder of the season and their dates are: the Tri-City Golf Tournament in St. Louis, June 28-29, Olympia Fields Country Club, a swing party, with July 13th as the tentative date; Elmhurst Country Club, Aug. 19th and Midlothian Country Club, Sept. 21. Walter Nay and David K. Olin are co-chairmen of the golf outing committee.

Moore Olympic Official

R. E. Moore, president of Moore Brothers Co., New York soap dispenser manufacturers, will go to London in July for the 1948 Olympic games with the U.S. gymnastic team. Mr. Moore is national chairman of the gymnastic committee of the Amateur Athletic Union of the U.S. and chairman of the Olympic Gymnastic Committee.

Elder Addresses CMRC

Robert F. Elder, a member of the board of directors and vice-president in charge of consumer research for Lever Brothers Co., Cambridge, Mass., was one of the speakers at the joint meeting of the Chemical Market Research Association and the Department of Business and Engineering Administration of Massachusetts Institute of Technology, held Apr. 8 at M.I.T. Mr. Elder, who spoke on "Use of Market Research in Top Policy Planning," stressed the need of management for alert and intelligent market research. He defined market research as "seeking to bring to the customer the maximum of comfort and satisfaction, at the minimum of cost and a maximum of profit. Mr. Elder added that "the work of the men in the laboratories could be made far more productive than it is today if they could start with the knowledge developed by sound market research of what customers want, what qualities or features are most important to them, and what ones can best be sacrificed if the margin between cost and selling price demands that compromises be made.

Prior to his association with Lever Brothers, Mr. Elder was Associate Professor of Marketing at Massachusetts Institute of Technology. Some of his earlier connections were with Brown Co., Portland, Me., on market research and new product development. He was a charter member of the American Marketing Society, the predecessor of the American Marketing Association.

Kistler to Blaw-Knox

Blaw-Knox Co., Pittsburgh, recently announced the appointment of R. E. Kistler as sales engineer for the fats and oils department of its chemical plants division. He was previously works manager in charge of the Ivorydale, O., plant of Emery Industries, Inc., Cincinnati. Earlier, Mr. Kistler had been with Swift and Co., Chicago, where he last served as division superintendent in charge of processing industrial and edible oils. During 1945, he was employed by another division of Blaw-Knox in the engineering of process equipment.

C. P. Long Heads A.O.C.S.

C. P. Long of Procter & Gamble Co., Cincinnati, was elected president of the American Oil Chemists'

C. P. LONG

Society at the 39th annual meeting held at the Hotel Roosevelt, New Orleans, May 4 to 6. Other officers elected at the meeting which was attended by almost 400 people include: first vice-president, V. C. Mehlenbacher of Swift & Co., Chicago; second vice-president, G. A. Crapple, Wilson & Co., Chicago; third vice-president, J. R. Mays, Jr., Barrow-Agee Laboratories, Inc., Memphis, Tenn.; fourth vice-president, L. B. Parsons, Lever Brothers Co., Cambridge, Mass.; Secretary, H. L. Roschen, Swift and Co., Chicago; and treasurer, J. J. Vollersten, retired chief chemist, Armour and Co.

Presentation of numerous technical papers on recent research in the field of oil chemistry highlighted the discussion sessions at the meeting.

R. T. Milner of the Northern Regional Research Laboratory, Peoria, Ill., has been appointed editor of the *A.O.C.S. Journal* succeeding H. L. Roschen of Swift and Co., Chicago.

Tri-City Golf Meet

The Associated Drug and Chemical Industries of Missouri will be host for the annual Tri-City Golf Meet on June 28 and 29 to the Allied Drug and Cosmetic Association of Michigan; the Chicago Perfumery, Soap and Extract Association and the Chicago Drug and Chemical Association. A cocktail party will be held at the Sheraton Hotel, St. Louis, June 28th, with lunch, golf and a dinner dance on the following day at Sunset Country Club.

Soap May Rise in Canada

Increases in the price of soap up to one and one-half percent of cost price, authorized by the Canadian Wartime Prices and Trade Board, May 3, to compensate for higher freight costs, which have risen 21 percent, may cause retail prices of soap to rise in Canada, according to soap manufacturers there. Retail soap price advances will probably range from one-half cent on regular pound boxes of laundry flakes or powder to a quarter cent on laundry bar and a fifth of a cent on toilet soap cakes. Synthetic detergent prices will remain unchanged.

In Detroit, opposite Windsor, Ontario, chain stores have reduced prices on packaged soaps by two to three cents and one cent on cakes of toilet soap, in keeping with recent reductions in soap prices at wholesale levels. The general reductions announced last month in the U.S. will not affect soap prices in Canada, according to the spokesman for one Canadian branch of a large U.S. soap firm, because of the recent increase in freight rates in Canada.

P & G Builds at Long Beach

An addition to the soap factory of Procter & Gamble Co. is being erected at 1601 W. Seventh St., Long Beach, Calif. The reinforced concrete structure, four stories high, will add a ground area of 92 x 127 feet to the plant, at a cost of $50,000.

Cos. Chemists' Organ

The second (March) issue of the *Journal of the Society of Cosmetic Chemists* was issued recently. In addition to a number of articles dealing with technical aspects of cosmetic chemistry, Dr. Dan Dahle, director of research of Bristol-Myers Co., Hillsdale, N.J., recipient of the first honorary membership in the society, writes on "Opportunities for Chemists in the Cosmetic Industry."

Wafer to W. Va. Board

Joseph M. Wafer, general manager of the Industrial Chemical Division, was recently elected a vice-presi-

JOSEPH M. WAFER

dent and director of West Virginia Pulp and Paper Co., New York. He has been active in the chemical sales field since 1917 and first became associated with West Virginia in 1924 as a salesman for Industrial Chemical Co., a subsidiary. Mr. Wafer has been general manager of the company's chemical sales division since Dec., 1943.

P & G Pays $1 Dividend

Procter & Gamble Co., Cincinnati, recently declared a year-end dividend of $1 per common share, payable on June 15. The dividend brought total distribution for the year ending June 30 to $4, as compared with $3.50 paid in the previous year.

Perfumers in Finale

The final dinner meeting of the American Society of Perfumers for the 1947-48 season was held the evening of June 2nd at Joe King's Rathskeller, New York. Entertainment followed the open meeting.

Magnus Addressess C. of C.

Percy C. Magnus, president of Magnus, Mabee & Reynard, Inc., New York, recently addressed the New London (Conn.) Chamber of Commerce on the European Recovery Program. His talk was entitled, "As I View It."

BIDS AND AWARDS

P. O. Soap Powder Bids

Bids on 2,500 pounds of soap powder in a recent opening for miscellaneous supplies by the Post Office Department, Washington, D. C., were received from E. F. Drew & Co., New York, five cents a pound; Draper Soap Co., Pawtucket, R. I., eight cents; Armour & Co., Washington, D. C., 5.375 cents; General Soap Co., Chicago, five cents; Utility Sanitary Supply Co., New York, 5.5 cents; Fischer Industries , Cincinnati, 4.45 cents; Peck's Products Co., St. Louis, 4.75 cents; Stevens Soap Corp., Brooklyn, 4.9 cents; Swift & Co., Washington, 6.37 cents.

Treasury Floor Wax Bids

The following bids on item 1, 6,000 pounds of floor wax (52-W-455) and item 2, 21,900 pounds of floor wax (52-W-465), were received in a recent opening for miscellaneous supplies by the Treasury Department, Bureau of Federal Supply, Washington, D.C.: Manhattan Kreole Products, Brooklyn, item 1, 28 cents and item 2, 25 cents; Lasting Products Co., Baltimore, item 1, 17 cents and item 2, 14 cents; By-Chemical Products Co., San Francisco, item 1, 21 cents and item 2, 18.5 cents; Sherwin-Williams Co., Washington, D. C. item 1, 30 cents and item 2, 27 cents; Puritan Chemical Co., Atlanta, item 1, 12.5 cents, in three-pound jars, and item 2, 14 cents, if all purchased in three-pound jars price is 12.5 cents on both items; Oil Specialties & Refining Co., Brooklyn, item 1, 16.6 cents, item 2, 14.3 cents; Buckingham Wax Co., Long Island City, N.Y., item 1, 16.3 cents and item 2, 14 cents; R. M. Hollingshead Corp., Camden, N.J., item 1, 16.5 cents and item 2, 12.5 cents; Twin City Shellac Co., Brooklyn, item 1, 16 cents and item 2, 14 cents; Trio Chemical Works, Brooklyn, item 1, 13 cents, item 2, 11.5 cents; W. H. Vale & Sons, Kansas City, item 1, 24 cents and item 2, 22 cents; S. C. Johnson & Sons, Racine, Wis., item 1, 26 cents, in five-pound cans, item 2, 25 cents; International Metal Polish Co., Indianapolis, Ind., item 1, 30 cents, item 2, 29 cents; Huntington Laboratories, Huntington, Ind., item 2, 26 cents; Crystal Soap & Chemical Co., Philadelphia, item 2, 25.4 cents; Windsor Wax Co., Hoboken, N.J. item 1, 16.28 cents and item 2, 13.2 cents; Uncle Sam Chemical Co., New York, item 1, 19 cents and item 2 15 cents; Penetone Co., Tenafly, N.J., item 1, 25.8 cents and item 2, 21.8 cents; Mudge Paper Co., Janitor Supply Department, Baltimore, item 1, 22 cents, item 2, 21 cents; Janitors Supply House Baltimore, item 1, 25 cents, item 2, 23 cents.

QMC Laundry Soap Award

Continental Soap Corp., Chicago, submitted low bids of 1.882 cents and 1.952 cents, which were accepted by the Army Quartermaster Corps, New York on 303,000 pounds of laundry soap in a recent opening for miscellaneous supplies. Other bidders in the same opening were: Armour & Co., Chicago, 25.82 cents a pound; Chicago Sanitary Products Co., Chicago, 24 cents; Wm. Messer Corp., New York, 30.38 cents a pound; Gillam Soap Works, Fort Worth, Tex., 21 cents; Spazier Soap & Chemical Co., Santa Monica, Calif., 23.75 cents and 25 cents.

Cleaning Compound Bids

In a recent opening for miscellaneous supplies by Raritan Arsenal, Raritan, N.J., the following bids were received on 110,500 pounds of cleaning compound: Axton Cross Co., Cheshire, Conn., 5.82 cents a pound; Continental Soap Corp., Chicago, 5.85 cents; Chicago Sanitary Products Corp., 6.95 cents; Pennsylvania Salt Manufacturing Co., Phliadelphia, 8.05 cents; Dorsett-Jones, Baltimore, 8.45 cents; Haviland Products Co., Grand Rapids, 6.54 cents; Superior Chemical Sales Co., Kansas City, Mo., 6.3 cents; Wyandotte Chemical Corp., Wyandotte, Mich., 5.64 cents; D. C. Cooper Co., Chicago, 8.5 cents; Cee Bee Chemical Co., Los Angeles, 9 cents; Turco Products Co., Los Angeles, 6.-14 cents; Pacific Chemical Co., Los Angeles, 8.2 cents; R. M. Hollingshead Corp., Camden, N. J., 10 cents; Mackenzie Laboratories, Chester, Pa., 8.55 cents; Magnus Chemical Co., Garwood, N.J. 14.125; National Cleanser Products Co., 7.45 cents.

Treasury Disinfectant Bids

In a recent opening for miscellaneous supplies by the Bureau of Federal Supply, Treasury Department, Washington, D.C., the following bids were received on a.) item 1, 5,500 gallons of disinfectant (51-D-394) and b.) item 2, 120 gallons of cresol solution (51-S-4540), from George Senn, Inc., Philadelphia, item 1, 80 cents and item 2, $3; A.M.R. Chemical Co., Brooklyn, item 1, 89 cents and item 2, $2.65; Industrial Distributors, New York, item 2, $3; Coopers Creek Chemical Corp., West Conshohocken, Pa., item 1, 62.7 cents; Rhodes Chemical Corp., Plainfield, N. J. item 1, 44 cents; Chemical Manufacturing & Distributing Co., Easton, Pa., item 1, 61 cents; R. M. Hollingshead Corp., Camden, N. J., item 1, 48.5 cents and item 2, $4; Clifton Chemical Co., New York, item 1, 98 cents; James Huggins & Sons, Malden, Mass., item 1, 52 cents and item 2, $2.56; Koppers Co., Tar Products Div., Kearny, N.J., item 1, 82 cents and item 2, $2.53; Uncle Sam Chemical Co., New York, item 1, 63 cents; West Disinfecting Co., Long Island City, item 1, $2.55 and item 2, $2.30; Casein & Oil Products Co., Boston, item 1, 76 cents; D. A. Collins Mfg. Co., Brooklyn, item 1, 94 cents, "Kilgerm", $1.14, "Pynectant", and $1.39 pine oil; Fine Organics, Inc., New York, item 1, 47 cents; Manhattan Lighting Equipment Co., item 2, $3.13; Allen Burns Co., Buffalo, item 2, $3; Selig Co., Atlanta, item 1, $1.25 and item 2, $2.65; Curran Corp., Lawrence, Mass., item 1, 97 cents and item 2, $1.60; C. B. Dolge Co., Westport, Conn., item 1, $2.95 and item 2, $2.60; E. B. Snyder Laboratories, Philadelphia, item 1, 76 cents and item 2, $2.85.

NEW TRADE MARKS

THE following trade-marks were published in the May issues of the *Official Gazette* of the United States Patent Office in compliance with Section 6 of the Act of September 20, 1905, as amended March 2, 1907. Notice of opposition must be filed within thirty days of publication. As provided by Section 14, fee of ten dollars must accompany each notice of opposition.

DIGESTEX—This in large and small capital letters for spot remover. Filed July 19, 1946 by Patek and Co., San Francisco. Claims use since Jan. 15, 1938.

DU-WETS—This in upper and lower case, extra bold, black letters for silver polish. Filed July 30, 1946 by Terramar Co., Los Angeles. Claims use since July 1, 1946.

ANHYDRO—This in upper case, extra bold letters for salt compounds for use in electrochemical metal cleaning processes. Filed Aug. 19, 1946 by Frank K. Foy, Ansonia, Conn. Claims use since Dec., 1943.

HYDREX—This in upper case, bold letters for detergents. Filed Aug. 19, 1946 by Foy Electro-Chemical Co., Ansonia, Conn. Claims use since July, 1946.

RIM—This in upper case bold letters, the "I" overprinting a large, outline figure 2 for cleaning fluid. Filed Oct. 10, 1946 by Ellis H. Dennett, Sudbury, Mass. Claims use since July 1, 1946.

MOUNTAIN GREEN—This in large and small upper case, bold letters for liquid cleaner for floors, walls, woodwork and dishes. Filed Nov. 29, 1946 by Essential Chemicals Co., Milwaukee. Claims use since Jan. 25,1946.

KENRO—This in upper case, extra bold letters for household soap in powder form for general laundry purposes. Filed Dec. 13, 1946 by Roy Spivey, Tuscaloosa, Ala. Claims use since Nov. 5, 1946.

HAPPY HOME MAKER—This in large and small capital letters, the word "it" appearing beneath "Happy" and "Maker" for shampoo soap in cake form, Filed Jan. 22, 1947 by Geo. A. Schmidt Co., Chicago. Claims use since Oct. 30, 1905.

MIST-TEX—This in upper case, bold letters for washing powder. Filed Jan. 10, 1947 by Hollis C. Hodson, Plainfield, Ind. Claims use since July 30, 1945.

COLSO DIRT CHASER—This in upper case, bold letters, the word "Colso" in a circular design above the other two words for powdered or granular detergent. Filed Feb. 24, 1947 by Central Ohio Supply Co., Columbus. Claims use since March, 1927.

ABEJA—This in upper case, extra bold, black letters for insecticides. Filed May 16, 1946 by McCormick and Co., Baltimore. Claims use since Mar. 1, 1946.

SURE-STIX—This in upper case, bold letters for germicidal solution to be placed in moistening machines. Filed May 27, 1947 by King Research, Inc., Brooklyn. Claims use since Mar. 17, 1947.

CORDACIDE—This in upper case, bold letters for toxic vapor material to be used in insecticides. Filed July 1, 1947 by Darworth, Inc., Simsbury, Conn. Claims use since June 11, 1947.

NYLSUDS—This in upper case, bold letters for soapless cleaning powder. Filed Apr. 24, 1946 by Maurella Products Co., New York. Claims use since May 8, 1946.

LIX—This in upper and lower case, extra bold, oversize letters for spot remover and dry cleaner. Filed May 9, 1946 by Johnson Products Co., Buffalo, N. Y. Claims use since Apr. 1, 1946.

DREWTERGENTS—This in upper case, bold letters within an outline for detergents and cleaning compositions. Filed Oct. 1, 1946 by E. F. Drew & Co., New York. Claims use since Aug. 19, 1946.

SOLTROL—This in upper case, bold letters for naphthas for use as dry cleaning solvent. Filed Nov. 25, 1946 by Phillips Petroleum Co., Bartlesville, Okla. Claims use since Feb. 9. 1946.

POLARIZED—This in upper case, extra bold letters for liquid soap. Filed Dec. 4, 1946 by Pyro-Penn Products Co., San Jose, Calif. Claims use since Oct. 1, 1941.

SWEETNCLEAN—This in large and small, upper case, bold letters for water-soluble, oil base, liquid detergent for general cleaning. Filed Mar. 13, 1947 by E. F. Drew & Co., New York. Claims use since Feb. 1, 1947.

BLACK DUCK—This in upper case, extra bold, black letters for liquid detergent containing solvents designed to remove rubber marks and other soil from floors. Filed Apr. 15, 1947 by Huntington Laboratories, Inc., Huntington, Ind. Claims use since Mar. 15, 1943.

X-APHIS—This in upper case, extra bold letters for insecticide. Filed Apr. 3, 1946 by Hovley & Dalby, Brawley, Calif. Claims use since Apr. 1, 1942,

DIADEM—This in upper case, extra bold letters for shampoos. Filed Dec. 23, 1946 by Algaeloin Corp., New York. Claims use since Nov. 15, 1946.

DUPONT—This in upper case, extra bold black letters in a oblate rule for insecticides. Filed Jan. 31, 1947 by E. I. du Pont de Nemours & Co., Wilmington. Claims use since Jan. 1, 1946.

BRUSHMASTER—This in upper and lower case letters for cleaning brush having a liquid soap dispenser on the handles. Filed June 24, 1946 by Ray Sullivan, San Francisco. Claims use since May 22, 1946.

The following trade marks are published in compliance with section 12 (a) of the Trade Mark Act of 1946. Notice of opposition must be filed within 30 days of publication and a fee of $25 must accompany each notice of opposition.

SAFE-T-SOL—This in upper case, bold letters ascending from right to left from which irregular lines run horizontally for dry spotting compound. Filed Oct. 15, 1947 by Patek and Co., San Francisco. Claims use since Jan. 15, 1939.

ESCOFOS—This in upper case, open letters for cleansing preparation. Filed Aug. 20, 1947 by Cowles Detergent Co., Cleveland. Claims use since Feb., 1946.

DOWRY—This in upper case, bold letters for sudsing cleaner. Filed Nov. 1, 1947 by Procter & Gamble Co., Cincinnati. Claims use since Oct, 2, 1947.

CONGO—This in upper case, bold letters for insecticidal insect repellent. Filed Aug. 4, 1947 by Northern Laboratories, Manitowoc, Wis. Claims use since June 17, 1944.

NICO—This in upper and lower case, extra bold, oversize, script letters for insecticides. Filed Aug. 25, 1947 by Stauffer Chemical Co.. San Francisco. Claims use since July 1, 1939.

NICO-DUST—This in upper case, bold letters for insecticide. Filed Aug. 25, 1947 by Stauffer Chemical Co., San Francisco. Claims use since Apr. 29, 1920.

CEN-PE-CO—This in upper case, medium bold letters for insecticide. Filed Oct. 16, 1947 by Central Petroleum Co., Cleveland, O. Claims use since Jan. 1, 1929.

BLUD-X—This in upper case, extra bold letters for solution for removing spots and stains from garments. Filed Aug. 6, 1947 by Huntington Laboratories, Inc., Huntington, Ind. Claims use since Feb., 1932.

METALENE—This in upper case, extra bold, black letters for cleaning fluid for cleaning metal. Filed July 5, 1947 by Fischer Industries, Inc., Cincinnati. Claims use since Oct. 1, 1939.

LONDON HOUSE—This in upper and lower case, medium bold, Old English letters for toilet and shaving soaps. Filed Aug. 6, 1947 by John Hudson Moore, Inc., New York. Claims use since Dec. 31, 1936.

DUMORE—This in upper case, bold letters for cleanser in powder form. Filed July 19, 1947 by Diversey Corp., Chicago. Claims use since Jan. 22, 1925.

Fatty Acids? Hardesty of course!

Every day it becomes more *a matter of course* to phone Hardesty for fatty acid requirements. Manufacturers of a diversified list of products have the Hardesty Habit . . . a habit which has formed because of Hardesty's habit of providing quality chemicals—*when* you want them, *how* you want them.

Some habits—the shoe you put on first in the morning, the way you button your coat—are meaningless, but the Hardesty Habit means quick deliveries *and* uniformity of products.

Where it's a matter of assured shipments of quality fatty acids, it's a matter of course to contact Hardesty. Of course . . . it's the W. C. Hardesty Company, 41 East 42nd Street, New York 17. At the other end of your telephone wire: Murray Hill 2-1920.

RED OIL • GLYCERINE • STEARIC ACID • WHITE OLEINE • STEARINE PITCH • HYDROGENATED FATTY ACIDS • ANIMAL AND VEGETABLE DISTILLED FATTY ACIDS.

W. C. HARDESTY COMPANY
41 East 42nd Street, New York 17
Factories: Dover, Ohio
Los Angeles, Calif.–Toronto, Canada

HARDESTY PRODUCTS ARE INDUSTRY'S KEYSTONE

FANCIFUL—Line drawing of the face of a cat for chemical compounds for industrial cleaning purposes. Filed Aug. 1, 1947 by Valentine Co., Seattle Wash. Claims use since Nov. 1, 1924.

SOIL-OFF—This in upper case, extra bold, black letters for spot and stain removers. Filed Aug. 7, 1947 by Soil-Off Manufacturing Co., Glendale, Calif. Claims use since 1905.

GREAT STUFF—This in upper and lower case, medium bold, script letters for soap and cleaning Compounds for car washing. Filed Aug. 11, 1947 by Great Stuff Products, Inc., Minneapolis. Claims use since Sept. 1, 1920.

GAMMANOL—This in upper case, bold, stencil letters for petroleum sulfonates used as wetting agents and emulsifiers. Filed Aug. 19, 1947 by Griffin Chemical Co., San Francisco. Claims use since July 10, 1940.

COWLES—This in upper case, extra bold, black letters for detergents. Filed Aug. 22, 1947 by Cowles Detergent Co., Cleveland. Claims use since Feb. 6, 1926.

VEK—This in lower case, extra bold, oversize letters for cleaning compound in liquid form for tile, porcelain, etc. Filed Sept. 8, 1947 by Anderson-Stolz Pharmaceuticals, Inc., Kansas City, Mo. Claims use since May 17, 1947.

ORIOLE—This in upper case, bold letters for liquid hand soap. Filed Sept. 8, 1947 by Crown Zellerbach Corp., San Francisco. Claims use since 1917.

EMBASSY—This in upper case, bold letters for liquid hand soap. Filed Sept. 8, 1947 by Crown Zellerbach Corp., San Francisco. Claims use since 1917.

GREEN GOLD—This in upper case, extra bold letters in descending order from left to right for toilet soap. Filed Sept. 8, 1947 by Hartman-Leddon Co., Philadelphia. Claims use since Sept. 16, 1926.

ALLAIN—This in upper case, medium bold letters for hard water soap. Filed Sept. 16, 1947 by Dry Goods Alliance, Inc., New York. Claims use since July 15, 1937.

WIL-O-WAY—This in large and small case, bold letters for general cleaning preparation. Filed Sept. 19, 1947 by S. L. Roberts & Sons, Dearborn, Mich. Claims use since May 1, 1947.

DE-TARN—This in upper and lower case, bold letters for chemical cleaner for metals. Filed Sept. 24, 1947 by Alice M. Freeman, Gladywyne, Pa. Claims use since July 14, 1947.

LILAC TIME—This in upper and lower case, bold, script letters, one word above the other for toilet soaps. Filed Sept. 24, 1947 by Houbigant, Inc., New York. Claims use since Sept. 1, 1947.

CLEANMASTER—This in upper and lower case, bold, italic letters for fabric cleaning compound. Filed Nov. 4, 1947 by Wade, Wenger & Associates, Inc., Chicago. Claims use since 1932.

LANOLECHE—This in upper and lower case, medium bold, script letters for toilet soaps. Filed Nov. 20, 1947 by New York Make-up Corp., New York. Claims use since July 30, 1946.

GREEN CROSS—This in upper case, bold letters, the words above and on either side of the upright section of a cross for insecticidal plant spraying operations. Filed July 15, 1945 by Lucas Kil-Tone Co., Philadelphia. Claims use since Jan. 11, 1915.

BL—This in upper case, extra bold letters within a bold rule in the shape of a semi-circle for disinfectant. Filed Aug. 20, 1947 by Buckman Laboratories, Inc., Memphis. Claims use since Nov. 1, 1945.

RATCEED—This in upper case, bold letters for rodent exterminator. Filed Sept. 2, 1947. by W. G. Reardon Laboratories, Inc., Port Chester, N.Y. Claims use since Mar., 1928.

RAT SEED—This in upper case, bold letters for rodent exterminator. Filed Sept. 2, 1947 by W. G. Reardon Laboratories, Inc., Port Chester, N. Y. Claims use since Nov. 9, 1927.

SAPROCOLEUM—This in upper case, bold and reverse letters for disinfectant. Filed Sept. 8, 1947 by Crown Zellerbach Corp., San Francisco. Claims use since 1917.

HARRIS FAMOUS ROACH TABLETS—This in upper case, bold and reverse letters for chemically prepared food for cockroaches. Filed Sept. 8, 1947 by Dora Russell, Baltimore. Claims use since Feb., 1923.

ODORA—This in upper and lower case, bold letters for insecticides. Filed Oct. 7, 1947 by Odora Co., Inc., New York. Claims use since Aug. 1, 1927.

MOTHAIRE—This in upper case, bold letters for insect repellant. Filed Oct. 7, 1947 by Odora Co., New York. Claims use since June 29, 1936.

WINTER-PHENE—This in upper case, bold letters for germicide. Filed Aug. 28, 1947 by Baird & McGuire, Inc., Holbrook, Mass. Claims use since Aug. 2, 1944.

ELIZABETH ARDEN—This in upper and lower case, bold script letters for shampoos. Filed Sept. 2, 1947 by Elizabeth Arden Sales Corp., New York. Claims use since Jan. 2, 1910.

FORT DODGE—This in upper case, bold letters on a lined oblate background for insecticides. Filed Oct. 16, 1947 by Fort Dodge Laboratories, Inc., Fort Dodge, Ia. Claims use since 1912 as to "Fort Dodge" and since Mar. 1, 1946 in present form.

Forms New Machinery Co.

Gilbert B. Kahn, formerly connected with Consolidated Products Co., New York used machinery dealers, recently set up his own organization for buying, selling, appraising and liquidating machinery, equipment and complete plants in chemical and allied industries. Offices and facilities are located at 75 West St., New York. The company will also have an export department.

SOCMA Names Officers

Dr. Elvin H. Killheffer of the development department of E. I. du Pont de Nemours and Co., Wilmington, was appointed to complete the unexpired term of Ralph E. Dorland, late president of the Synthetic Organic Chemical Manufacturers Association, which met May 25-27 at Shawnee Inn, Shawnee-on-Delaware, Penna. Dr. Killheffer, who is a former first vice-president of the Association, is succeeded in that post by Dr. W. M. Billing, general manager of the synthetic department of Hercules Powder Co., Wilmington, Del. Two new members of the board appointed at the annual meeting were Victor E. Williams, director of sales of the New York office of Monsanto Chemical Co., who succeeds Dr. Harold L. Simonds, resigned, and J. P. Remensnyder, Heyden Chemical Co., New York, who succeeds Dr. Billing.

At the meeting, Dr. August Merz of Calco Chemical Division, American Cyanamid Co., Bound Brook, N. J., and honorary member of the association's board of governors, paid tribute to the memory of the past president, the late Ralph E. Dorland of Dow Chemical Co.

NON-IONIC DETERGENTS

(*From Page* 48)

properties of non-ionic detergents.

1. They possess compatibility with a wide range of materials under a large variety of conditions.

2. They do not irritate human skin and do not de-fat it to as great an extent as do other types of synthetic surface active agents.

3. They enhance the detergency of many anionics and in particular the alkylaryl sulfonates when employed for washing cotton fabrics in any type of water.

Bibliography

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2. H. C. Speel, The Journal of Investigative Dermatology, 6, 293, (1945).
3. M. C. Dodd, F. W. Hartmann, and W. C. Ward, Journal of the American Pharmaceutical Association, 35, 33, (1946).
4. W. C. Griffin and R. S. Rose, Jr. Proceedings of the Scientific Section of the Toilet Goods Association, Number 4, December 6, 1945.

RAW MATERIAL MARKETS

As of June 4, 1948

WITH the single exception of tallow, whose price remained about the same, prices of most fats and oils rose from one to six cents a pound during the past month. Sharpest advances were registered by edible oils. Coconut oil was two and one-half cents higher on about this date than a month earlier. Tallow continues in the doldrums. For more than a month now the price of tallow has remained steady at 13 cents in spite of reports of sales for export. Reduced interest in tallow by soap makers seems to be the principal reason for its present price. There is talk that tallow may go even lower as a result of possible reduced buying by exporters.

Edible oils, reflecting the possibility of repeal of the tax on oleomargarine, plus continued strong demand for export for edible purposes, continue their price advances. Peanut and corn oil showed identical advances, prices going from 31 to 35 cents, soybean oil quoted at 29 cents was five cents higher than a month previous, while cottonseed oil prices, making the sharpest gain of any oil during May, rose six cents, going from 31 to 37 cents a pound. Lard prices increased a fraction of a cent to 23.12 cents.

Prices of animal and vegetable fats and oils aren't the only things that are rising. According to a Department of Commerce survey, stocks of oils and fats are mounting. Holdings on March 31 were reported to be 1,500,000,000 pounds, 200,000,000 pounds higher than on the same date a year earlier. The increasing of stocks, in spite of high level consumption of fats and oils, results from large scale production domestically and increased imports. Although stocks are still some 500,000,000 pounds short of what is considered "normal" holdings, production may be smaller than last year and the U. S. Department of Agriculture is advocating continuation of fat salvage by housewives. The decline in animal fat production, reduced imports of copra and restrictions on whale oil imports were listed as reasons for the decline in oil output.

Continuance of the world wide fat and oil shortage for another two years, with gradual easing of supplies was predicted recently by the president of Unilever, Ltd. He stated that the Netherlands Indies was in a position to contribute most to meeting the

Now with oils and fats still scarce and costly, soap manufacturers more than ever appreciate how silicates extend these expensive supplies and make good soap.

For PQ Silicates are more like soap than any other alkali. PQ Silicates (really a family because we offer 50 different ones) act on dirt in the same way as soap, but of course they cost much less. PQ Silicates accelerate wetting action, emulsifying power, deflocculating and suspending ability. Another advantage obtainable more economically from the silicates is preventing the redeposition of removed dirt.

PHILADELPHIA QUARTZ COMPANY
Dept. B, 129 South Third Street, Philadelphia 6, Pa.

Have you checked up lately on the percentage of PQ Silicate used in your various products? Perhaps an adjustment will improve the profit and the product too. Our Technical Dept. shall be glad to discuss how you can stretch soap fats with PQ Silicates.

urgent need for edible oils and fats, with an estimated output in 1948 of between 200,000 and 250,000 tons of edible oils and fats, as compared with 200,000 tons exported in pre-war.

Confirming the views of the Unilever head as to production of oil and oil bearing materials in the N.E.I., a bulletin of the Office of Foreign Agricultural Relations of the USDA predicted larger copra exports from the N.E.I. and Malaya during May and June.

An important factor in the fat and oil market and one which has been keeping the market in a state of flux is the third quarter export allocation of fats and oils. A meeting to discuss the allocation was held in Washington, June 3 by representatives of the fats and oils industry and officials of the Department of Agriculture.

Authorization to import 5,000 metric tons of palm oil without restrictions as to end use was announced last month by the U. S. Department of Agriculture. The amount is in addition to 27,500 tons which may be imported for use in the terne and tinplate industry. The maximum amount that may be licensed to any importer at any one time without restriction as to end use is either 250 metric tons from the Netherlands East Indies or 750 metric tons from the Belgian Congo. New licenses, which may be obtained from the Administrator of War Food Order 63, will be valid only for a period of 90 days.

Production of palm oil on the east coast of Sumatra increased 900 tons to 2,300 tons over February and further increases for April are expected.

A new and increased price schedule on soda ash and caustic soda was announced late in May by one of the leading producers. New prices of soda ash for zone 1, in paper bags of 100 pounds are: $2.75, light and $2.85, extra light and dense; for light or dense in barrels, add 50 cents per 100 pounds; for zones 2 and 3 the usual differentials apply.

Caustic soda, per 100 pounds, is now priced at: $4.40 for the solid in 700 pound drums; $5.80 for flake in 100 pound drums and $4.80 in 400 pound drums or barrels and $4.80 for ground and powdered in 450 pound drums or barrels. Usual price differentials apply for zones 2 and 3.

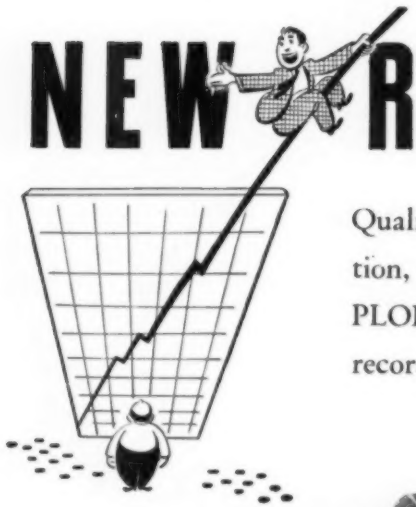
New prices on carload lots of 58 percent light soda ash, per 100 pounds, are: bulk, $1.15; paper bags, $1.40; burlap bags, $1.55 and barrels, $1.90. The 58 percent dense product is now (100 pounds in carload lots) $1.25 in bulk, $1.50 in paper bags; $1.65 in burlap bags and $2 in barrels. Prices on 76 percent light soda ash, per 100 pounds, in carloads or drums will be $3.05 and flake, ground or powdered, $3.45; seller's tankcars of 50 percent liquid caustic, basis 76 percent, will be $2.40 per 100 pounds and cars of 70 percent liquid caustic, basis 76 per cent, will be $2.50.

Supplies of insecticides in 1948 will be sufficient, generally, to meet the needs, according to a recent bulletin of the U. S. Dept. of Agriculture. Some tight spots may develop by the end of the season. DDT supplies are tighter and price increases expected.

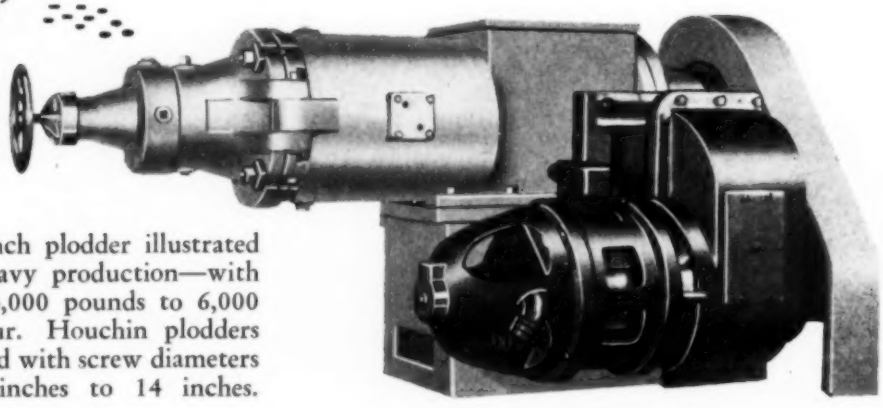
HOUCHIN PLODDERS

From the smallest to the largest—set

NEW RECORDS...



Quality of Production, efficiency, ease of operation, etc., all help to make the HOUCHIN PLODDER a leading factor in setting new records of production.



The giant 14-inch plodder illustrated above is for heavy production—with a capacity of 4,000 pounds to 6,000 pounds per hour. Houchin plodders also are furnished with screw diameters of from 2½ inches to 14 inches.

A small combination plodder especially designed for laboratory use—for making tiny cakes of perfumed soaps, is also available. It requires only a 1/3-h.p. motor with Texrope drive.

For further information write to

HOUCHIN
MACHINERY COMPANY, INC.

Manufacturers of Soap Making Equipment

Fifth and Van Winkle Avenues **Hawthorne, N. J.**

PRODUCTION SECTION

Synthetic Bar Detergent

EVER since supplies of synthetic detergents have been plentiful, following exploitation of petroleum as a source of secondary alkyl sulfates, aryl naphthene sulfonates, etc., most enterprising manufacturers of cleaning compounds have considered the idea of a synthetic bar detergent. The delay in their appearance on a soap-hungry market is a measure both of the ease with which powder and liquid forms of these products can be made and sold, and of the great difficulties in formulating a successful bar detergent. Yet a bar detergent has many attractions. Apart from the sales appeal of a substitute which looks like a bar of conventional soap, it has three practical advantages over liquids and powders. First, it is less wasteful in use. Second, it requires neither bottles nor cartons. Third, it is less bulky in terms of effective detergent power than either of the other forms, so that it requires less transport and storage space.

The credit for the first reasonably successful synthetic bar product probably belongs to British Solvates Ltd., who marketed "Novosope" last summer. When, early in 1945 Shamash of that firm conceived the idea of a bar detergent, he selected "Teepol" as the basis for his investigations, both on account of his previous experience with it and because it was then becoming plentiful. Although the production of "Novosope" followed the general principles of soap making, a conventional soap plant was unsuitable. By improvisation and adaptation of existing plant facilities, the company has managed to raise the output and to improve the product.

Early Defects

THE first Novosope comprised "Teepol" as the active ingredient, combined with china clay as a filler and abrasive, and synthetic wax, rosin, and emulsified wax as binders. However, the problem was only half solved as the bar tended to disintegrate into a messy sludge on standing after use. It was rough on the hands and effloresced badly during storage. It was discovered more or less by accident that when an alkyl aryl sulfonate was added in traces to "Teepol," by a synergistic action it gave greatly increased foam. A second discovery was that by using sodium acid phosphate, itself a surface-active agent, the "Teepol" was converted into a pasty mass ready for immediate mixing with other ingredients.

Large-scale Processing

AS carried out by the firm today, the process begins with the micropulverizing of sodium acid phosphate. Reduction of this material to an extreme fineness is very important. If the particles are oversize the surface of the tablet becomes lumpy. After micropulverizing, the sodium acid phosphate is taken to a central processing room. Here part of it is mixed with "Teepol" and digested in steam-jacketed reaction vessels. This mixture is then poured into a series of shallow water-jacketed pans. To each has been added a trace of sodium thiosulfate. Precipitation takes about eight hours.

The pasty mass from the open pans is incorporated with further quantities of micropulverized sodium acid phosphate in a one-ton mixer. The rest of the ingredients are added at this stage. The most important is an alginate, which acts as a gel-forming binder and retards solubilization of the bar in water. Also added are sodium sulfate to absorb the balance of free water, the trace of alkyl aryl sulfonate necessary to increase lathering, a little lanolin to enhance the smoothness of the bar in use and to offset in part the strong detergent action of "Teepol," and a perfume to mask the persistent and characteristic smell of this material.

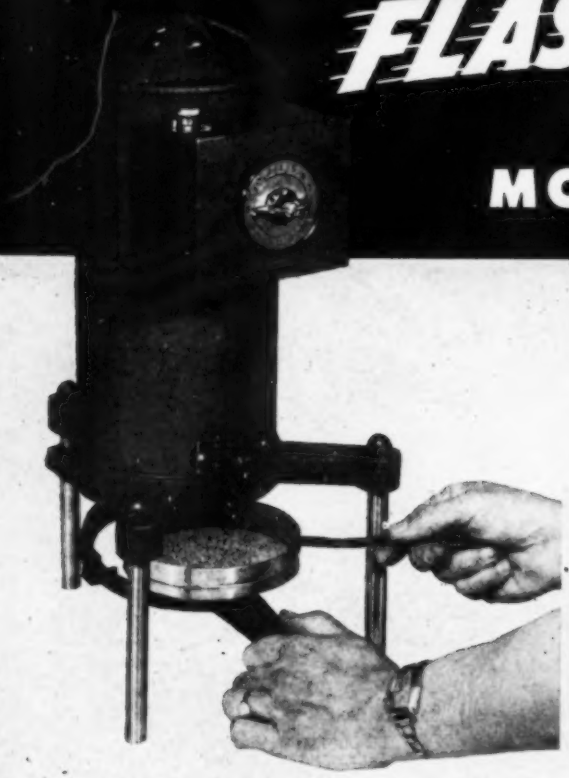
After mixing, careful control of temperature is imperative. The mass from the mixer is transferred to water-jacketed vessels and allowed to cool to a fixed temperature before being fed into the plodder. Should the mass be allowed to vary from this temperature it sets too quickly or too slowly; in either case it cannot be handled subsequently, so that the whole batch must be scrapped. Temperature control is maintained during plodding. Both the barrel and the extruding orifice are water-jacketed. The extruded billets are lubricated with talc and cut into blanks, which are then allowed to cool before stamping. Here again a precise temperature is essential.

After stamping, the tablets are placed in racks and allowed to mature for 24 hours. They are then subjected to an interesting process to prevent efflorescence. Each tablet is brushed lightly with a dilute alginate solution. This smooths away any efflorescence while at the same time completely sealing the surface. The bars are then ready for bulk packing and dispatch.

The product is sold only as a household cleaning compound for dishwashing ,etc. It is not a substitute for toilet soap. Besides export markets in Europe and South America, another promising market is the Merchant Navy, because the product lathers well in salt water. *Manufacturing Chemist 19*, 153-8 (1948).

Good quality fatty acids are obtained from cottonseed oil foots

FLASH-DRY SAMPLES TO DETERMINE MOISTURE CONTENT

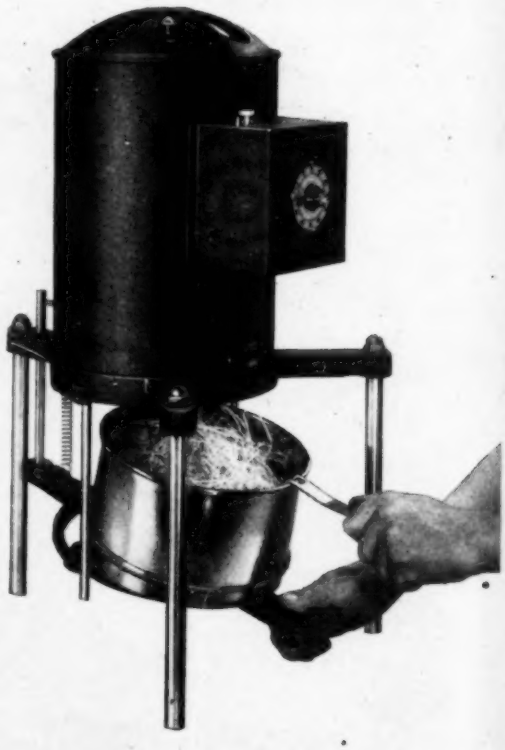


A complete line of Dietert-Detroit Moisture Tellers is available for the rapid, accurate moisture determination of such substances as chemicals, foods, fabrics, grains, sands, fuels, clays, semiliquids and others.

Model 275 is designed for materials not sensitive to drying temperatures. It has a drying pan 5" in diameter holding up to 100 gram samples.

Model 275T is used for all substances, the testing of which requires precise temperature control. It may be used as a flash drying oven for liquids or small samples.

Model 278T is used for bulky samples up to 500 grams. It is ideal for handling a large number of liquid samples and for drying materials in the wet screen analysis. The pans are 8" in diameter and may be from 1" to 4" in depth.



Write for descriptive folder and prices.

2697

by saponifying the foots with caustic soda, and adding 0.05-0.5 per cent of potassium persulfate or sodium hypochlorite during the boiling. The soaps are grained out, separated, and acidified. The fatty acids are then distilled under reduced pressure. H. R. McClain, to Procter & Gamble Co, U. S. Patent No. 2,435,456.

Alkyl Aryl Sulfonates

The surface-active properties of alkyl aryl sulfonates are improved by solvent extraction to remove unalkylated aromatic sulfonic acids. This purification results in greater calcium tolerance and better wetting power of the products. J. J. Carnes, to Am. Cyanamid Co. U.S. Patent No. 2,433, 316.

Fat Stabilization

Fatty material can be stabilized by adding a concentrate of solvent-extracted vegetable oil antitoxidant which has been treated with ammonia, in a concentration of 0.1 to 20 per cent. This mixture is less susceptible to oxidation than when antioxidant is used alone. L. O. Buxton and C. E. Dryden, to Nopco Chemical Co. U.S. Patent No. 2,434,790.

Alcohol Sulfate Additive

The formation of gels by aqueous solutions of fatty alcohol sulfates is prevented by addition of 0.05-0.5 gram-molecule of ammonium chloride, ammonium sulfate, ammonium acid phosphate or the ammonium salt of a number of acids. The optimum concentration required is different for each salt. B. Buis and D. M. Samuel, to Shell Development Co. U.S. Patent No. 2,434,683.

Lever Washability Tests

Eighty per cent of British textile manufacturers avail themselves of the services of a free Washability Laboratory maintained by Lever Brothers at Port Sunlight. The findings are regarded as absolutely reliable. The service tells the manufacturers how different types of textiles should be washed, dried and ironed. The manufacturers in turn usually pass the information on to the users. During World War II and the post war period, general interest in this type of service has increased, largely because of the shortage of textiles and the consequent effort to prolong their useful life. J. Kalmer, *Soap* (India) 1, 18-19 (1948).

Adsorption Analysis

Adsorption analysis of oils compares favorably with other methods of fractionation. The spread of iodine values for soybean oil and soybean oil esters for a 1 ½ foot adsorption column is equivalent to that reported for a 50-foot countercurrent extraction column. The passage of soybean glycerides through a single adsorption column also gives a fractionation equal or superior to that of repeater low-temperature crystallization. Recoveries were 82 per cent for glycerides, and 90 per cent for esters. Binary mixtures of fatty-acid ethyl esters considered inseparable by distillation techniques have been fractionated on adsorption columns. Oleate-linoleate mixtures were successfully fractionated by this method. C. L. Reinbold and H. J. Dutton, J. *Am. Oil Chemist's Soc.* 25, 117-20, 120-4 (1948).

Propose New Specification for High-Titer Soap

A NEW proposed Federal Specification for powdered, high-titer built soap is now under consideration by the Federal Specifications Board, Bureau of Federal Supply, Treasury Department, Washington, D. C. Copies of the proposed specification are currently being circulated for comment to all known manufacturers of the material prior to circulation to Federal departments for approval. Copies may be obtained upon request from Harry Fleisher, chairman, technical committee on detergents, Federal Specifications Board, Bureau of Ships (336), Navy Department, Washington 25, D. C.

The new specification, which bears the tentative number P-S-536, provides that the soap shall be of one type and grade. Detailed composition is shown in table I. Other specific requirements are: 1.) The soap shall be a homogeneous uniform mixture of soap and alkalies in powdered form. It shall be readily soluble. 2.) The soap shall have a light, uniform color. 3.) The odor shall not be objectionable in the soap as received, or in hot-water solution. The soap shall not leave an objectionable odor in the objects after washing with a water solution of the soap and rinsing thoroughly with hot water. The odor of the material shall conform to the odor of the sample approved by the bureau concerned. The sample shall be kept in an airtight container for comparison with the sample submitted for inspection.

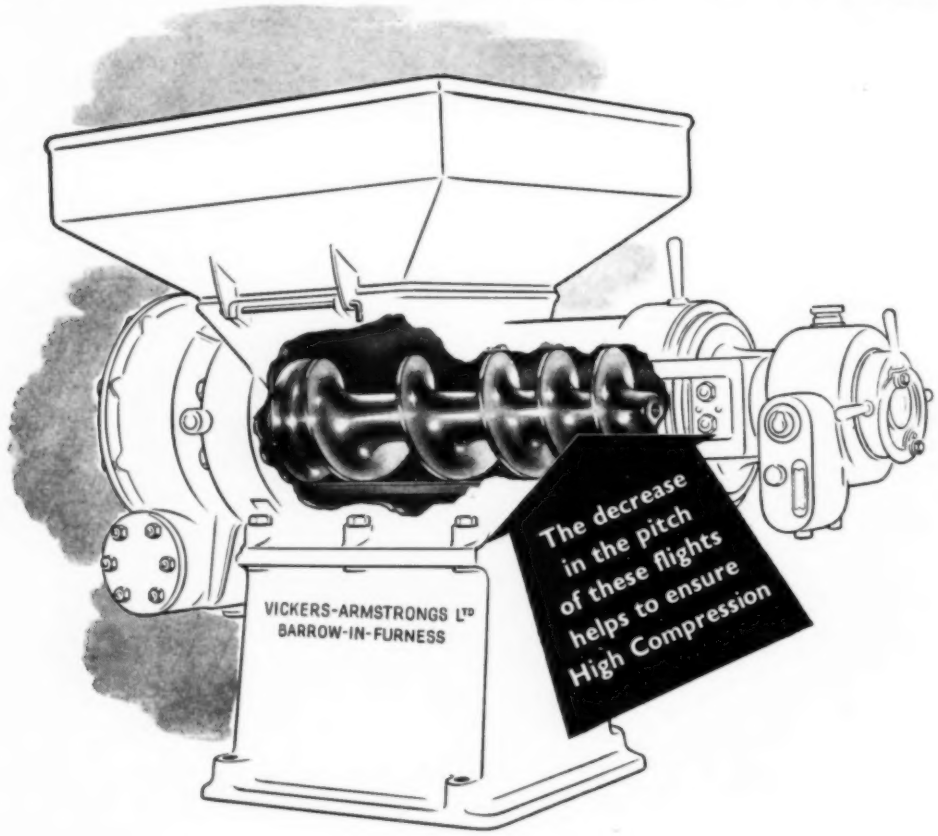
Detailed requirements concerning methods of sampling, inspection and tests; packaging, packing and marking for shipment; and requirements applicable to individual departments are covered in the proposed draft of the specification.

TABLE I—Composition

	Maximum	*Minimum*
	Percent	
Moisture and matter volatile at 105°C.	11	
Free alkali, calculated as sodium hydroxide, NaOH	0.2	
Alkaline salts, calculated as sodium carbonate, Na_2CO_3		22 percent
Matter insoluble in water	1.0	
Chloride (calculated as sodium chloride)	0.5	
Anhydrous soap		56 percent
Titer of the mixed fatty acid prepared from the soap		39°C.
Residue retained on a No. 12 sieve	1.5	
Passing through a No. 140 sieve	18.0	
Rosin	None	
Unsaponifiable matter	1.0	
Starch	None	

O./B.T.48

Most worth-while ideas are simple



TO achieve the smooth compact texture which is the hallmark of every good toilet soap, high compression of the milled ribbons is essential in the plodder stage. This is secured in the Vickers-Armstrongs' Plodder by various features in the design. Examine the worm and you will find a progressive decrease in the pitch of the flights towards the pressure plate end. This acts in two ways. It ensures an ample supply of soap mass being pushed forward into the cylinder and it subjects this mass to an increasing compression as it approaches the pressure plate. All air is thus expelled.

This feature is only one of the many details that make Vickers-Armstrongs' Plodders and Mills the most efficient and reliable machines that precision engineering can provide.

Vickers-Armstrongs Limited

VICKERS HOUSE, BROADWAY, LONDON, ENGLAND

SHIPBUILDERS ★ ENGINEERS ★ AIRCRAFT CONSTRUCTORS

Detergent Builders

THE building of synthetic detergents by addition of materials which increase surface activity is of paramount importance to the consumer because it provides improved results for his detergent dollar. To the manufacturer, builders often determine whether or not a potentially high-priced product can be introduced to the market. For example, the presence of sodium sulfate or sodium chloride in synthetic detergents has sometimes been incorrectly interpreted as diluent. While such materials may be concomitant to the manufacture of these products, when used in the proper amounts, they are not diluents but function as builders.

Detailed study of the effect on surface and interfacial tensions of electrolytes to a number of anion-active and cation-active surface-active agents, showed that the concentration of both types of agents can be reduced from one-tenth to one-half by addition of a suitable concentration of eletrolyte, without reducing the surface activity in terms of this type of measurement.

Addition of suitable kinds and amounts of electrolytes to anion-active agents also shows the following desirable effects: Reduction of critical conductivity, improvement in wetting speed, increase in lather, and increase in detergency. The valence of the added builder has a marked effect on the physico-chemical properties of anionic surface-active agents. For example, increase in valence of the cation of the electrolyte increases the time of wetting of an anion-active agent. Wetting was very slow by addition of aluminum chloride to dodecyl benzene sodium sulfonate; the effect was less with magnesium chloride, and even less with sodium chloride. The effects are influenced by concentration.

Builders for anion-active agents which hydrolize to yield alkaline solutions are in general better builders than those which provide essentially neutral solutions.

Addition of anionic electrolyte such as silicates and phosphates to cation-active surface agents, in general, results in inactiviation of the agent. Additions of cationic electrolytes such as calcium and aluminum chlorides, to the same agents in general have only a slight effect.

Electrolytes added to nonionic surface-active agents have little effect. Careful study of this whole problem indicates that addition of builders to surface-active agents can be reduced to a science. J. C. Harris, *Am. Dyestuff Reporter* 37, P266-70 (1948).

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Detergent Preservatives

Aqueous solutions of sodium carboxymethyl cellulose and of methyl ethyl cellulose—agents sometimes added to synthetic detergents and other surface-active agents—are subject to deterioration by bacterial degradation. Study of bacteriostatic substances for use in such solutions showed the following to be effective at the percentage concentrations given: Pentachloro phenol 0.1, trichlorophenol 0.1, monochlorothymol 0.1, phenyl mercuri acetate 0.001, sodiumethyl mercuri thiosalicylate 0.001, *para*-chloro-*meta*-cresol 0.01, Proflavine 0.01, octyl cresol 0.1, monobutylated mixed *meta*-*para*-cresol 0.1, and cetyl trimethyl ammonium bromide, 0.01.

In some uses the cellulose derivatives are much more likely to suffer degradation through growth of bacteria than in others. When inorganic bacterial nutrients are absent, relatively slow attack occurs. G. G. Freeman, A. J. Baillie, and C. A. Macinnes, *Chem. and Industry* 1948, 279-82.

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Titration of Agents

An accurate, direct titration method for the determination of anion-and cation-active compounds in solution has been developed. This uses new partition end-points based on the solubility in organic solvents of complexes between cation-active agents and bromophenol blue, and anion-active agents and methylene blue, respectively. Not all surface-active compounds are necessarily suitable for titration by the new method. The method has proved easy and accurate in the hands of unskilled operators. T. Barr, J. Oliver and W. V. Stubbings, *J. Soc. Chem. Ind.* 67, 45-8 (1948).

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Hydrolysis of Soap

The effect of excess lauric and oleic acids on the conductivity and on the pH of potassium laurate and sodium oleate solutions was observed The decrease in the specific conductivity corresponded with the formation of acid soaps and mixed soaps, All of these systems, even with 100 or 150 moles per cent excess of acid, were slightly alkaline. L. M. John and J. W. McBain, *J. Am. Oil Chemists' Soc.* 25, 141-3 (1948).

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Carbonate Determination

A method is described for a simple, rapid, and accurate determination of carbonates, bicarbonates, and percarbonates. The method depends upon evolution of carbon dioxide by treatment with a nonvolatile acid. The carbon dioxide passes into an evacuated vessel and is quantitatively absorbed in this in a standard solution of barium hydroxide. Excess barium hydroxide is backtirated with oxalic acid. From the result the amount of original salt is calculated. L. Scheck, *Seifensieder-Ztg.* 74, 52-4 (1948).

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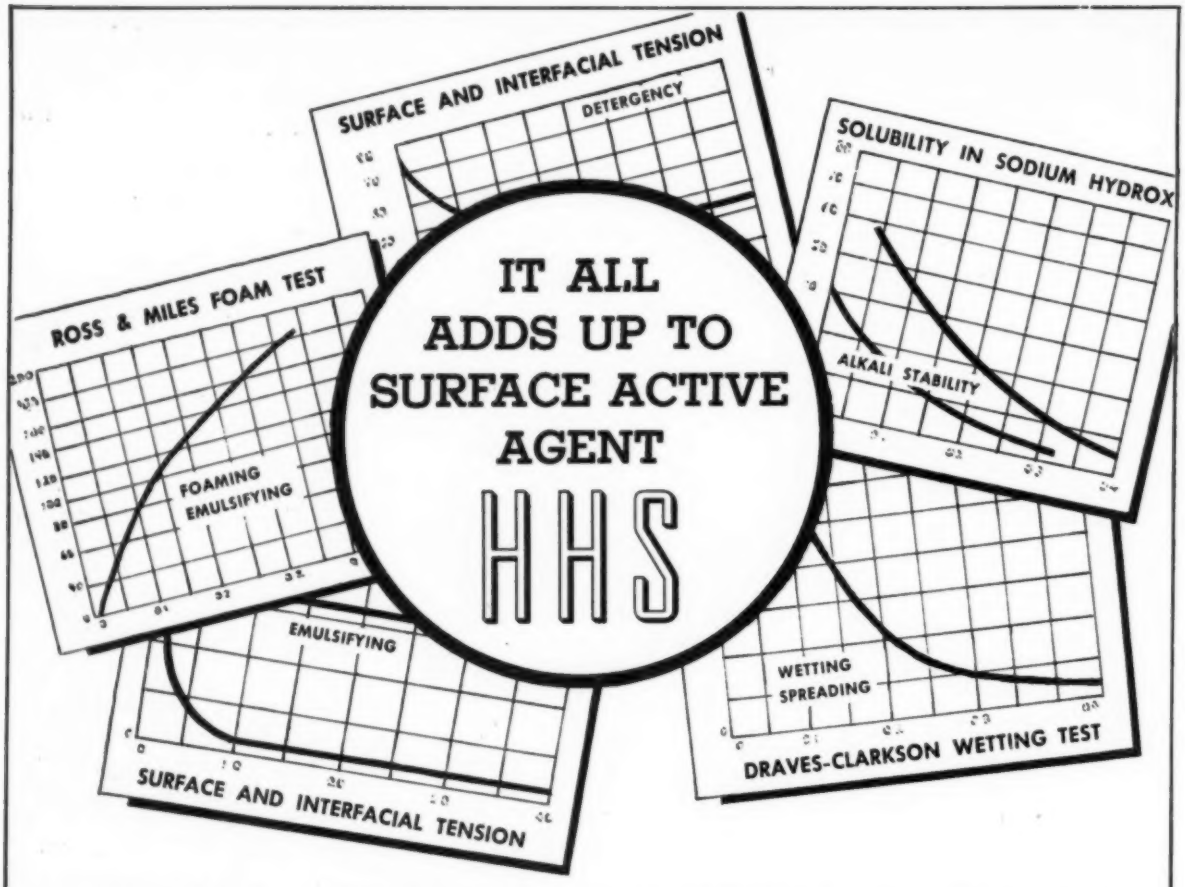
Improving Oil Stability

Corn oil, soybean oil, and grain sorghum oil were deodorized in a laboratory unit equipped with a take-off for removal of samples at various times during deodorization. The stability of the oils increased rapidly during the initial stages of deodorization. This increase is apparently caused by the heat destruction of pro-oxidants such as peroxides, rather than by removal of volatile materials through steam distillation. These laboratory results were confirmed by a similar study of commercial deodorization of alkali-refined and winterized corn oil. A. R. Baldwin, *J. Am. Oil Chemists' Soc.* 25, 33-5 (1948).



CUT COST . . . CUT DIRT with this NEW Organic Chemical

HHS has all qualities required of a Surface Active Agent:

ACID STABILITY	EMULSIFYING
ALKALI STABILITY	FOAMING
SPREADING	DETERGENCY
WETTING	NEUTRAL

HARD WATER STABILITY

One pound of HHS can be used to replace two to four pounds of soap in your formulae. At 13c per pound, this new Surface Active Agent offers economies to every manufacturer of soaps and allied products.

A free testing sample of HHS with complete technical data is yours, upon request. Quantity lots in dry flake form are now available in 135-lb. net drums.

PUBLICKER INDUSTRIES Inc.

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PRODUCTION *Clinic*

By E. G. THOMSSEN, Ph.D.

A SHORT time ago, we visited the laboratory of a manufacturer of insecticides. Our conversation drifted toward the sales and technical aid rendered by various suppliers of raw materials and the great progress which has been made in the past five years through the introduction of new toxicants both for insects and fungi. Included in our group was the owner of the business, who is not a technical man. Most of his knowledge regarding insecticides and fungicides has been gained from his own staff of technicians and through the actual use of insecticides.

In the midst of our discussion, this proprietor changed the direction of our remarks somewhat from the technical to the practical side of the subject. He stated that generally he interviewed salesmen and technical field men as they called upon his company. To some extent his company depended upon information obtained from them as to the formulation of his insecticides. In recent months, however, he had become unsure and skeptical regarding the information passed on to him. Frequently, he went on to say, the statements were contradictory and he did not know what to believe. He had a laboratory of his own but his technical men were not in a position to carry on extended research. Their duties consisted largely of control of quality and analyses of raw materials.

As an example of his predicament, the insecticide manufacturer named a supplier who sent two representatives to see him within a week. The first was a salesman, who was anxious to make a sale and told the merits of his products enthusiastically. The insecticide business proprietor made notes of the salesman's assertions for they had to do with problems

he was confronted with. A few days later, a technical representative of the same company came in for a visit with the laboratory men. The proprietor, present during the call, listened to what the technical representative had to say about the same raw material discussed by the salesman. With the notes he had taken during the salesman's call, the insecticide maker searchingly cross-examined the technical representative, who did not know the tenor of the salesman's statements. On certain points the technical man discredited the salesman's assertions and referred to his data to support the contradictions. The proprietor did not embarrass him by saying his company's salesman had made the misrepresentations. Undoubtedly they were made in good faith, but later information, based upon more extended tests, had proven certain properties of the toxicants did not to stand up as first claimed.

Two other similar cases, which recently came to our attention involve a filling machine and the addition of a new chemical to a tubed product.

A liquid filling machine was sold to a manufacturer at a distant point. A local sales representative assured the purchaser it would suit his purpose very efficiently. Instead of onsidering all the conditions under which the machine would operate, the salesman merely took filled samples of the product and sent them on to his company. When the machine arrived, months later, and the erector came to install it he found that the drop to the machine hopper was too high, that the lines ran through unheated rooms and that the product became aereated. Considerable hard feeling resulted when the purchaser refused to pay for the filler and demanded to exercise his prerogative to return the machine.

In the case of the tubed product, the salesman had been apprised by his company of the results obtained when a new product was added to certain creams. He recommended its use to a manufacturer whose product enjoyed a large volume of sales. Unfortunately, the manufacturer had in his employ a not-too-technical, technical man. When the new ingredient was first added it gave new, desirable properties. In their enthusiasm the salesman and chemist sold the owner on these properties. It was accepted without any shelf life experiments. When the product matured, it was discovered, too late, that an incompatibility brought about by a slow chemical reaction, resulted. The product deteriorated, sales went down and there was considerable explaining to be done by the salesman, his company and the inexperienced technical man. The incident was finally adjusted before a lawsuit was started.

The conclusions to be drawn from such occurrences are obvious. Sales and technical departments should get together and be certain that technical information is based upon latest authentic facts. Minor details are very often of greater import in considering machinery installations than may appear to be the case. Thoroughness in

appraising all conditions is necessary to completing a sale. Too much originality may lead to difficulties. Time is an important test with any new product or change in an established one. Technical and especially the younger technical men should not let their enthusiasm run away with them nor should they depend too much upon hearsay information. Such information is of great value but only if it is first verified upon actual test.

New pH Meter

Macbeth Corp. of New York is featuring a new continuous indicating direct reading explosion proof pH meter. This meter is portable and is designed for use in an atmosphere containing highly inflammable or volatile liquids. It permits a greater scope of pH control in this field. The piece of apparatus is portable, sturdy, is provided with flow-type electrodes and has a connection to operate at a remote location.

Daintex

Hercules Powder Co., Wilmington, Del., announce that "Daintex," its liquid wetting-out agent and penetrant which cuts sudsing time and gives whiter whites or brighter colors, is available in any amount. A small pocket-size folder describing the properties and uses of "Daintex" is available upon request. "Daintex" can be used with standard soaps and builders for washing all kinds of soiled clothes in commercial laundries. Actual tests show that "Daintex" aids removal of surface and impregnated soil from fabrics in less time than can be done with soap and alkali alone. "Daintex" also shortens washing cycles in commercial laundries by wetting out loads quickly and making it possible to eliminate one suds operations. It also effects a saving in detergent costs.

San-I-Tanks

Metal Glass Products Co. of Belding, Mich., have long specialized in a great variety of glass lined and stainless steel tanks for the liquid process industries. In their latest catalog may be found descriptions of open top, horizontal, half round, vertical, closed and other types of tanks to fit practically any specification. These tanks and stock pots are available in sizes from five gallons up to 600 gallons. They may be had with agitators, special openings and fittings, mounted and special legs or supports and provided with easily removable covers. They also offer a long line of sanitary fittings, necessary for handling and filling liquids. Anyone contemplating the installation of tanks will find it profitable to study the catalog issued by this company.

Label Coding

It is very important in many directions to know the age and other information regarding a preparation. The easiest and surest way of doing so is to code labels. J. Edward Baum of New York offers the "Champion Label Coding Machine" for this purpose. It handles labels from seven-eighths of an inch by one inch to eight and one-half inches by eleven inches at the rate of up to 200 labels per minute. The machine is easily and completely adjustable. Further information is available upon written request.

Triangle Filler

In visiting soap plants, one frequently sees equipment made by Triangle Machinery Co. of Chicago, for filling soaps and detergents. This company is a leader in the field. To those who are seeking to fill limited quantities of dry products this company offers a "Model SPA Volumetric Filler" and "Triangle P-1 Volumetric Filler." These dry filling machines may be quickly and easily adjusted to fill many products in sizes from one-quarter of an ounce up to 16 ounces at the rate of 30 to 60 packages per minute. Triangle also builds a line of high speed automatic fillers. Detailed information may be had by writing to the company.

Alrose Emulsifier Bulletin

Announcement of a new technical bulletin on "Nonisol 210," a polyoxyalkylene fatty ester, was made recently by the Alrose Chemical Co., Cranston, R. I. Applications of the new product include its use as an emulsifier for such insecticide concentrates as "Pyrenone," as a detergent in emulsion and non-aqueous cleaners and as a sludge dispersant in fuel oils. Copies of the bulletin and samples of the material are available on request.

Automatic Carton Feeder

A new, automatic carton feeder that provides a higher productive capacity for filling dry and semi-dry products into cartons, cans, jars and other stiff containers was developed recently by Stuyvesant Engineering Co., Lyndhurst, N. J. This unit consists of a magazine feed and is used directly with a package-filling machine. The operator keeps the feeder filled with empty cartons and the filling machine automatically fills them and pushes them out of the side of the magazine, ready for the next operation of adding the closure. In cases where the carton must be carried to the next operation on a conveyor, the carton feeder can be arranged to deposit the filled cartons on the conveyor belt. According to the company, normal filling speed can be considerably increased by using the feeder. Only one operator is required for both filler and feeder. Where there is overflow of the loose product as it is dumped fom the filling machine to the container, a vibrator can be supplied in the carton feeder to settle the product while it is being filled. The entire feeder unit can be set aside for bag filling.

Onyx Data Sheets

Onyx Oil & Chemical Co., Jersey City, recently issued a technical data sheet on "Catiosan" and "Catiosan T," cationic wetting agents and emulsifiers that combine detergent and germicidal effects. Listed are suggested fields of use, properties, and chemical and physical characteristics.

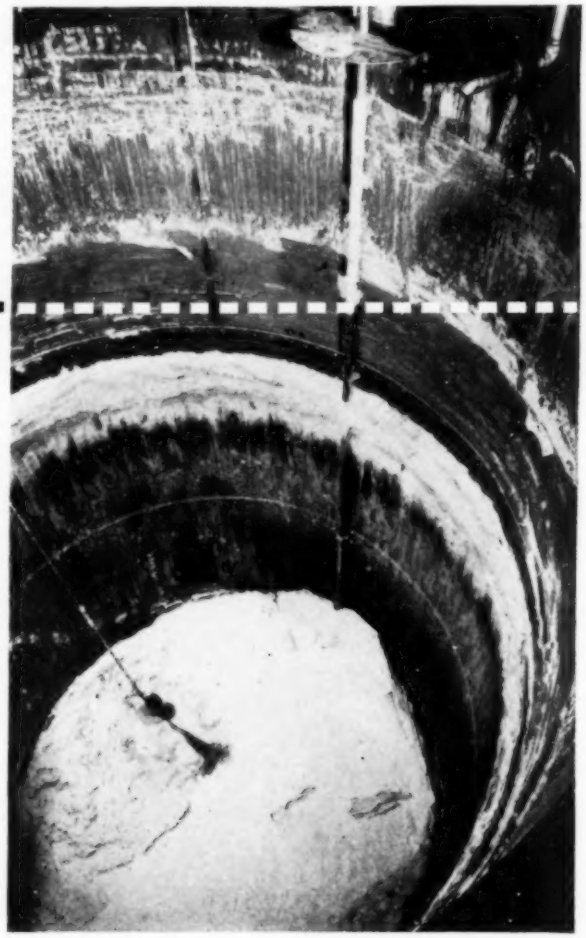
Cashew Nut Resin Booklet

Resins derived from the liquid in the shell of cashew nuts and marketed under the trade name "Cardolite" are described in a new booklet issued recently by Irvington (N. J.) Varnish & Insulator Co., sole producer of such resins. Applications for over 40 of these resins include their use as solvents in insecticides. "Cardolite" is

Are your old kettles

CORRODING AT THE LIQUID LEVEL?

Replace that top section with Lukens Clad Steel



"Except for severe corrosion in the upper ten feet of our old soap kettles, there's still a lot of useful life in them." To those companies, Lukens suggests salvaging kettles by replacing the top ten feet with a new section made of Lukens Clad Steel.

Ordinary steel was used, of course, in old soap equipment. Today we recommend Lukens Nickel-Clad, Stainless-Clad, Inconel-Clad or Monel-Clad according to conditions to be encountered. Equipment will be long-lived, upkeep less, and products safeguarded against contamination.

Soap manufacturers use Lukens Clad Steels in such applications as evaporators, crutchers, filters, hoppers, amalgamators, pressure tanks, plodders, mixers and storage tanks. In glycerine production, evaporator bodies, salt catchers, filters and bleaching tanks of clad steel give excellent service.

Lukens offers you the most complete range of clad steels available—up to 178″ wide or from $\frac{3}{16}$″ to over 3″ thick. Clad metal is uniformly thick and permanently bonded to steel backing plates. Standard claddings of 10% or 20% of total plate thickness suit most applications.

Bulletins 255 and 338 give additional information. For copies, write Lukens Steel Company, 446 Lukens Bldg., Coatesville, Pa.

LUKENS

Nickel-Clad Stainless-Clad
Inconel-Clad Monel-Clad
STEELS

SOLID METAL ADVANTAGES WITH CLAD STEEL ECONOMY

• • SPEED SCRAP TO THE MILLS TO MAKE MORE STEEL • •

a phenolic product with special reactive characteristics due to the structure of the high molecular weight side chain of the cashew nut shell liquid phenols. The booklet also gives technical data on the properties of these resins.

Soap Dispenser Folder

American Dispenser Co., New York, recently issued a leaflet on "Lathurn," a soap dispenser that gives out a heavy, creamy lather. A feature of the dispenser is that the valve is located at the top, and pumps up the soap from the bottom of the dispenser by means of a monel supply tube. The valve and springs are made of stainless steel. The unit is of one piece and is attached to wall or mounting surface by means of screws that fit at the top and base of the dispenser. The glass globe of the "Lathurn" dispenser is encased in metal, except for a slit section at the side where the supply of soap in the machine can be seen. Another model is "Lathurn No. 3, which has a glass globe, is chromium plated, and is of 10 ounce capacity.

American Dispenser Co. recently moved to new quarters at 115 E. 23rd St., New York 10.

Ross Cartoning Folder

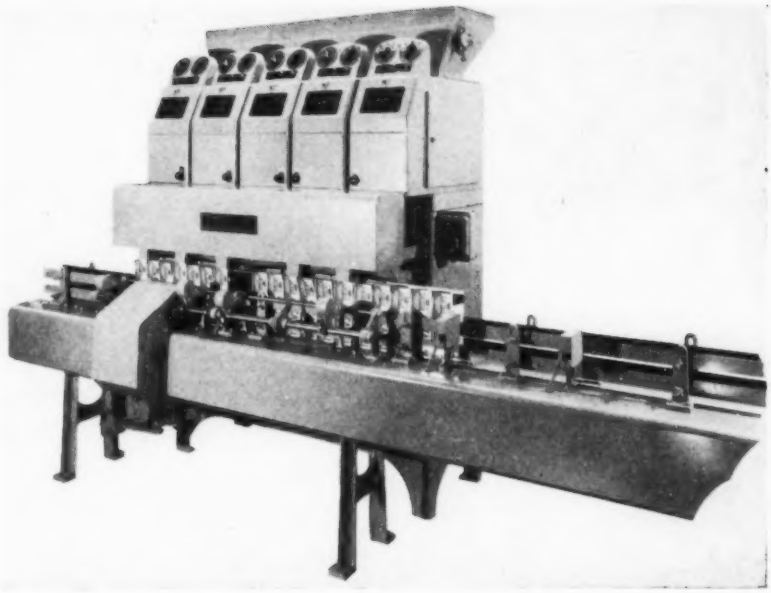
A. H. Ross Co., Dayton, O, recently issued a two-color, four-page circular devoted to their line of cartoning machines. The folder is fully illustrated and shows and describes a number of features available with Ross automatic and semi-automatic cartoning machines. Copies are available by writing the company.

Bulletins Available

Pamphlets recently brought out by Charles B. Chrystal Co., New York, entitled "Some Further Talk About Talc" and the "Story of Pumice Stone" are available by writing the company.

Issues Coating Folder

Morton Chemical Co., Greensboro, N. C., recently issued a folder on their line of "Duramite" chemically resistant coatings. The folder describes the "Duramite" line of chemically inert paints and coating materials and tells where they may be applied. Copies of the folder are available on request.



Above: The new, high speed, automatic "Elec-Tri-Pak" weighing and filling machine featured by Triangle Package Machinery Co., Chicago, at the recent National Packaging Exposition in Cleveland. A feature of the machine is automatic stopping of filling operation if insufficient number of cartons is delivered. Booklet available.

Bulletin on "Targicides"

Chemical Manufacturing and Distributing Co., Easton, Pa., recently issued a three-page, technical bulletin on their "Targicides" detergent sanitizers. The "Targicides" are synthetic detergents to which have been added a quaternary ammonium germicide. The three "Targicides:" "H," "M" and "L" tested phenol coefficients against *E. typhix* at 20° C. of 10, 10 and 8.9 respectively. The Board of Health of Philadelphia has granted the company permission to offer "Targicides" as a cleansing and disinfecting combination, the company reports.

Distributes "Plaracot"

Lien Chemical Co., Chicago, is now distributing the "Plaracot Utility Cloth" for general purpose cleaning and polishing. The cloth is a non-woven, non-porous, plastic and rayon material. When wet it is soft and pliant. It does not absorb dirt and can be cleaned by dipping in soapy water. After washing, "Plaracot" can be ironed. Regular sheets of the material measure about 18 x 32 inches. Suggested resale prices (by sanitary supply dealers) range from $1.50 to $2 for a bundle of 12 cloths. Prices are lower for quantity.

TGA Lanolin Standard

The scientific section of the Toilet Goods Association, New York, recently issued a specification for anhydrous lanolin. The board of standards recommends that all purchasers of the material use the standard as minimum specification.

Silicates Stop Dusting

Silicate of soda used to coat soap particles of spray-dried, granulated and chip soaps to reduce dusting is discussed in the May issue of *"Silicate P's&Q's,"* monthly bulletin of Philadelphia Quartz Co., Philadelphia.

Pneumatic Conveyor Book

Pneumatic conveying systems are discussed in a recent bulletin of Convair Corp., Pittsburgh, manufacturer of the "Convair" line of pneumatic conveying systems. Conveying systems for a number of applications are discussed and diagrams showing possible solutions for prob-

lems relating to carrying materials pneumatically accompany the discussions. Systems employing inert gases where air cannot be used as the conveying medium are discussed and described with diagrams in the booklet.

New Molding Aid

A new lubricant and mold-release agent for molding water-dispersible powders such as detergents into cakes was announced recently by Glyco Products Co., Brooklyn. Incorporation of "Diglycol Stearate S" in the molding powder permits faster ejection, prevents sticking, breaking and surface imperfections and adds to the cohesive strength of the molded product according to the company.

New Broom Device

A new aluminum alloy attachment for push type brooms that permits the broom head to turn 180° about the center pivot pin was introduced recently by Beda Distributing Co., San Francisco. The new implement, by permitting the head of the broom to rotate, allows it to be used in narrow spaces. The attachment works automatically. When the head of the broom pushes against an object it turns from the force of the pressure. This turning saves handle breakage and broom threads from shattering. The "Swi-vel Sweep" can be detached from one broom and used on another.

Floor Color Booklets

Coloring of sidewalks and store floors is discussed in three recent folders of A. C. Horn Co., division of Sun Chemical Corp., Long Island City, N. Y. The use of carbon black for darkening air entrained concrete is discussed in two of the folders, while the third deals with grey, green, brown, red and black cement floors colored with "Colorundum."

Givaudan Flavors Catalog

A new, 24-page catalog of its line of flavors was issued late in May by Givaudan-Delawanna, Inc., New York. Prices, recommended concentrations and related information are given.

New, Large Pouring Spout

The addition of new, large size pouring spout to its line of aluminum

pouring spouts for packages of free flowing granular materials was introduced recently by Seal-Spout Corp., Newark, N. J. The new spout, No. 6-2A, has a 30 percent larger pouring opening than the largest model, and is particularly adaptable for dispensing soap powders, etc. The spouts are automatically attached to packages by special inserting machines which can be supplied for any size package.

Tablet Germicide Folder

Edwards-Councilor Co., Norfolk, Va., recently issued a leaflet on its line of "Steramine," quaternary ammonium germicide tablets for use in kitchen sanitation. The leaflet illustrates and describes ways to use the tablets for dishwashing, cleaning refrigerators, coffee urns, etc. Composition of the tablets is also discussed and properties are compared with quaternary solutions and chlorine compounds. The tablets are packed 100 to a bottle, 12 bottles to a case. They are designed to retail for $15.00 a case. Color of the tablets is blue to indicate their presence in water.

Introduces New Wax

Sloane-Blabon Corp., New York, manufacturers of smooth surface floor coverings, recently introduced a new linoleum floor wax for home use. The new product is called "Sloane Quality Wax" and is of the no-rubbing self-polishing, emulsified type. It is applied with cloth or applicator and can be used on linoleum, resilient enamel floor coverings, asphalt, plastic, rubber and cork tiles and on hardwood floors. The new wax is available in pint, quart, and five-gallon cans and 55-gallon drums. The company plans a national advertising campaign for the new wax.

New Electrotype Cleaner

"Optimus Electrotype Solvent," specially formulated for use in electrotype pan scrubbing machines, was brought out recently by Optimus Detergents Co., Matawan, N. J. The new solvent cleaner is used in the pan scrubbing machine, mixed with standard solvent, kerosene, etc. It is supplied in concentrated form to be diluted with kerosene.

Discusses "Sanitationist"

The current rat control campaign and the role of the "Plant Sanitationist" are discussed in the May and April issues, respectively, of *Sanitation News Letter*, published by Joseph E. Seagram & Sons, Inc., Louisville. In addition, the company recently published another installment (III-Wall Washing) in its series "Basic Cleaning Operation." The latter brochure describes in detail and with illustrations proper wall washing technique. The role of the plant "sanitationist," described as the key man in the control of the departmental plan of sanitation in the plant, is outlined. His duties, the personnel he hires and works with, materials used in sanitation, methods of cleaning, work schedules, costs and rating are all discussed in the April issue of the *News Letter*.

New Socony Solvent

Socony-Vacuum Oil Co., New York, has recently developed a new petroleum product especially for use in aerosol fogging. The new material, designated "S/V Sovacide F," is said to be particularly effective when used with DDT in exterminating mosquitos, houseflies and grasshoppers. Now available in commercial quantities, the product's use on farm crops is still experimental.

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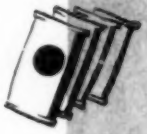

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PRODUCTS AND PROCESSES

Hard-water Soaps

Soaps having excellent lathering, emollient and softening properties and soluble in hard water, are made by treating the alkali-metal derivative of polyhydroxy alcohols with alpha-halo higher fatty acids, or their salts or esters. H. H. Guest(to J. B. Williams Co. U.S. Patent No. 2,435,829.

Organic Sulfonates

Detergents of good washing power are prepared by heating aliphatic compounds with sulfonyl chloride in the presence of light and catalysts, to give sulfonyl chlorides which are hydrolyzed to sulfonates. A yield of 33 per cent was obtained, based on Pennsylvania gas oil. J. Ross, D. J. Potter, and S. Yolles to Colgate-Palmolive-Peet Co. U.S. Patent No. 2,434,746.

Skin-protective Cream

The cream contains methyl salicylate as a light-screening agent dimethyl phthalate as an insect repellent in isopropyl alcohol-silica gel, together with a film-forming material and a wetting agent. A suitable film-forming material is a mixture of ethyl cellulose and shellac, and a suitable wetting agent is "Duponol." W. F. Huppke and A. L. Sodergreen, to West Disinfecting Co. U.S. Patent No. 2,435,005.

Barrier Cream

A barrier cream for use of workers handling TNT and other nitro compounds consists of:

	Per Cent
Paraffin wax, m. p. 135°F	20
Petroleum jelly	40
Lanette wax as emulsifier	10
Water	30

Although this cream is greasy it is said not to interfere with ordinary work. Dry, airborne, particles chiefly attack the hands and face. Therefore the barrier cream should require prolonged washing for removal, thus ensuring that all dangerous dusts are washed away. *Manufacturing Chemist* 19, 158 (1948).

Bleaching Fats or Soaps

Fatty acids, fats, soaps, and waxes are bleached by an aqueous mixture of a chlorite and a persulfate in the molar ratio of 2:1. Persulfate addition apparently activates the bleaching function of the chlorite. The rate increases with temperature. C. A. Hampel, to the Mathieson Alkali Works Inc. U.S. Patent No. 2,433,662.

Detergent Patent

The presence of inorganic phosphates formed in *situ* during the preparation of detergents containing sulfated or sulfonated compounds decreases the tendency of the mixture to corrode iron or steel process kettles. The effective inhibitor is not necessarily a soap-building phosphate. When sulfonation is complete, the free phosphoric acid is neutralized, and the resulting salt is the active inhibitor. No organic material is phosphatized in the process. Pyrophosphoric acid is used with a fuming sulfuric acid in an example, for sulfation of a mixture of coconut oil and tallow. After neutralization, the resulting active detergent contains about 15 per cent by weight of sodium pyrophosphate. The product retains its color and does not corrode ordinary metal containers. Colgate-Palmolive-Peet Co. British Patent No. 585,622.

Preparing Washing Agents

Inexpensive washing agents are prepared from mineral oils by treatment of a close-cut fraction approximating $C_{16}H_{34}$ with sulfur dioxide and chlorine in the presence of ultraviolet light, forming the derivative $C_{16}H_{33}SO_2Cl$ and hydrochloric acid. By saponification of this product with aqueous caustic solution, the alkyl sulfonate and sodium chloride are formed. The material after saponification is a viscous liquid containing 50 per cent or more of alkyl sulfonate. *Seifensieder-Ztg.* 74, 35 (1948).

Alkyl Sulfates

Among the synthetic alkyl sulfates are those of secondary alcohols, called "Tergitols," for example, the sodium salt of 3,9-diethyl tridecanol-6-sulfate or of 7-ethyl-2-methyl undecanol-4-sulfate, or of 2-ethylhexanol (octyl alcohol) sulfate. Higher alcohols are also esterified with dicarboxylic acids or sulfodicarboxylic acids to give numerous useful wetting agents and detergents. High-molecular unsaturated fatty alcohols such as oleyl alcohol are converted by sulfation into similar saturated compounds, with a sulfate group attached to the end carbon and added on at the unsaturated linkage, to give oleyl alcohol disulfate. In the form of the triethanolamine salt this is particularly suited for making a liquid shampoo. This can be formuated to give an acid reaction.

Reaction products are also made by the sulfochlorination of paraffin hydrocarbons. The alkyl sulfonates so obtained, called "Mersolates," have been used for mechanics' hand soaps as well as for general detergent applications. They are high in emulsifying power and so defat the skin rather markedly. They are somewhat similar in properties to the fatty alcohol sulfates. H. Janistyn, *Seifensieder-Ztg.* 73, 201-3 (1947).

Fat Splitting

To split garbage grease, tallow, animal and vegetable oils, water alone is used above 180°C. and under a pressure to keep the water in the liquid state. A heat interchange occurs between hot fatty acid and relatively cool water at the top of a vertical tower, and a heat exchange between relatively hot glycerol water and cool fatty material at the bottom. A ratio of fat to water is kept at 10:6. Part of the hydrolyzed fat is recycled and mixed with the neutral fat to give 5-25 percent of free fatty acid in the starting material. Emery Industries, Inc. British Patent No. 594,141.

Discuss Soap, Sanitary Chemicals at ACS Meeting

THE American Chemical Society's 113th meeting, held in Chicago recently, was marked by announcement and discussion of a number of new developments of interest to the soap and sanitary chemicals fields. Production of good soap at low cost from tall oil was described in a paper by Dr. Foster Dee Snell and Irving Reich of Foster D. Snell, Inc., New York.

On the sanitary chemicals side, Dr. Lyle D. Goodhue of Phillips Petroleum Co., Bartlesville, Okla., reported development of a cheap, all-purpose aerosol bomb container, which has made possible a whole line of self-propelled aerosol products, including germicides, deodorants and floor wax. Another speaker told of a new quaternary ammonium compound effective against *Staphylococcus aureus*.

Sugar cane as a new source of aconitic acid, used in manufacture of synthetic soaps, was also reported, while other papers dealt with a new plastic product applicable for killing termites and for other purposes and with fluorescent pigments said to be used in the soap field, among others.

In the Society's division of colloid chemistry Dr. Snell and Mr. Reich reported that experiments have shown that tall oils are efficient and economical cleaning agents.

"For many years it has been common practice to add considerable amounts of rosin to laundry soaps," the Snell-Reich paper observed. "During the soap-making process rosin is converted to soap and acts as an extender of the fatty-acid soaps. Tall oil is a mixture of about equal amounts of fatty matter and rosin-like materials. "In the soap-making process, the tall oil is converted into rosin soaps and fatty soaps. The rosin soaps made from tall oil are comparable to ordinary rosin soap in detergent effect. Fatty soaps made from tall oil show the cleaning power and the sudsing power of many common vegetable oil soaps." In their study, the authors of the paper said, they compared the most closely related soaps of the new soap-making material and of the older types. Techniques for determining foaming and cleaning characteristics were described.

"It was found," the report states, "that the fatty acid component of tall oil, when saponified, loses less of its detergency in hard water than do fatty materials like oleic acid (red oil) under similar conditions. This condition was also found when the soap from the rosin-like component of tall oil was compared to soap from commercial rosin. Tall-oil soap showed considerable sudsing power.

"Commercial grades of acid refined tall oil are much better than rosin and are valuable soap-making ingredients. Tall oil soaps can be improved considerably by removing unsaponifiable materials. These unsaponifiables remain in the final soap at present and are a hindrance to both cleaning and sudsing. Striking improvements in both cleaning and sudsing occurred when these substances were removed from the tall oil. Thus, the future potentialities of tall oil as a soap making material are even greater than realized at present."

The new quaternary ammonium compound reported at the convention was described in a paper by Drs. Edward F. Degering and P. A. Tetrault of Purdue and Harold J. Gryting, of Alrose Chemical Co., Providence, R. I. It is, they said, effective against *Staphylococcus aureus* at a dilution of one in twenty thousand in either water or the presence of 10 percent serum. It was prepared in an attempt to combine the germicidal properties of phenolic compounds with those of the quaternary ammonium compounds and was found to be the best of a series of about fifty chemicals synthesized and evaluated. The chemical name of this new compound was announced as: 5-(2-decyl)-2-hydroxy-3-methylphenyl-2-(2-oxoethyl) pyridinium chloride.

Aconitic acid, which has applications of great value in manufacture of synthetic soaps, can be produced in considerable volume in the process of making molasses from sugar cane, it was reported by R. J. Furse and Leon Godchaux II, of Godchaux Sugars, Inc., New Orleans, La.

It has long been known, their paper remarked, that sugar cane juices contain aconitic acid, but until recent years chemists have underestimated the amount present. In one plant at Raceland, La., 180 tons of the acid were extracted last year, while the entire Louisiana sugar cane crop, it was estimated, could supply more than 4,000,000 pounds of this acid annually.

Plastic products useful for termite control, for increasing the cleansing power of detergents and as a substitute for soap, were developed at the University of Chattanooga's Industrial Research Institute, it was revealed in another paper by Dr. Raymond B. Seymour, Ira Branum, Jr., and Frank Harris. The compounds were developed as an outcome of a study of formation and properties of water soluble plastics containing acids.

"Reaction of these new compounds with chlorinated carbolic acid has produced water soluble compounds which kill termites in wood and prevent mildew and mold growth on cloth," the paper said. "Further treatment with metal salts, such as mercury, has made these products insoluble in the wood or on textiles and thus they have become many times more effective. It was also found that these water soluble plastics would react with ethylene oxide manufactured from natural gas, to produce other water soluble plastics that can be used in place of soap. The original water soluble plastics produced very thick solutions, but the reaction products with ethylene oxide give water solutions as thin as water itself. When these products were added to synthetic detergents, they increased their cleansing power."

NEW PATENTS

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PATENTS, TRADEMARKS AND COPYRIGHTS

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Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired to Lancaster, Allwine & Rommel.

No. 2,438,955, Insecticide comprising mono-alkylated diphenylene sulfides and method of using same, patented April 6, 1948 by Sager Tryon, Long Island City, and Peter La Roche de Benneville, New York, assignors to Allied Chemical & Dye Corp. New York. An insecticide adapted for combating larvae of chewing insects comprising a monoalkylated diphenylene monosulfide, the alkyl group of which contains from three to six carbon atoms, admixed with a carrier therefor.

No. 2,440,082 Thermally vaporisable fumigant comprising sensitized ammonium nitrate and a pesticide, patented April 20, 1948 by John Stocks Flanders, West Kilbride, and Elwyn Jones, Ardrossan, Scotland, assignors to Imperial Chemical Industries Great Britain. A fumigating composition consisting of a mixture comprising a thermally vaporisable pesticidal compound, ammonium nitrate and an ammonium nitrate-sensitising salt of chromic acid in amount sufficient to render the composition capable of propagating throughout itself at ordinary atmospheric pressure an exothermal reaction which initated by local heating.

Index $NaPO_3$ as Inhibitor

The action of sodium metaphosphate in inhibiting the precipitation of calcium carbonate has been studied. A conductometric method was used to determine the precipitation of calcium carbonate from solutions of calcium sulfate and sodium carbonate in the presence of sodium metaphosphate. An index of the inhibitory action of the metaphosphate is log of the product of the real calcium-ion concentration times carbonate-ion concentration, over the equilibrium calcium-ion concentration times carbonate-ion concentration. At 35° C. with two mg. of metaphosphate per liter, the value of this index is between 2.45 and 2.50. It increases to about 2.65 with 16 mg. per liter. The index with two mg. per liter of metaphosphate decreases with increasing temperature to about 2.20 at 75° C. M. Breton, Bull. soc. chim. France *1947*, 297-302.

New Antioxidant

Norconidendrin may be isolated from western hemlock sulfite waste liquor. The compound possesses antioxidant activity in both hydrogenated and unhydrogenated oils and in lard. Its activity is comparable with that of other polyphenolic antioxidants such as nordihydroguaiaretic acid. The activity was greater in substrates which contained only small amounts of natural antioxidants. The effectiveness can be appreciably enhanced by the addition of acid-type synergists. Norconidendrin may be added either before or after deodorization of the fat with about equal effectiveness. When added before deodorization, it contributes no odor, color, or flavor to the finished oil. G. S. Fisher, L. Kyame, and W. G. Bickford, *J. Am. Oil Chemists' Soc. 24*, 340-43 (1947).

Waxes from Fatty Acids

During the war the acid hydrolysis of fats for the production of glycerine led to the accumulation in Australia of considerable quantities of tallow fatty acids. A study has since been undertaken of conversion of these to ketones, in order to use the surplus fatty acids to alleviate the wax shortage. It was found that a number of metallic oxides and carbonates may be used as catalysts for the preparation of dialkyl ketone from higher fatty acids in the liquid phase. All cause violent frothing which can be controlled by adding the fatty acid gradually to the catalyst at 330-360° C. The crude ketone is greasy, but its properties are greatly improved by pressing. R. C. Curtis, A. G. Dooson, and H. H. Hatt, *J. Soc. Chem. Ind.* 66, 402-7 (1947).

Acorn Oil

Although it is probable that acorns are seldom as abundant as popularly supposed and harvesting for commercial utilization would be difficult, solvent extraction of the oil was studied to determine its feasibility. A comparison of the results for extraction of cocoa butter and acorn oil shows that if the same extractor is operated under similar conditions on these materials, there are the same number of theoretical stages in the extractor whether the feed is acorn meal, acorn expeller cake, or cocoa bean expeller cake. A sample of crude acorn oil had the following characteristics: d at 25°C. 0.907, *n* at 25° 1.4677, acid number 5.6, saponification number 190, and iodine number 106. The oil content of acorns is 2.5-16 per cent. R. H. McCormack, *J. Am. Oil Chemists' Soc. 24*, 299-303 (1947).

Water Purification

A method for large-scale water purification has been developed using a modified resinous ion-exchange method, for use in southern Palestine. Brackish waters are desalted to render them suitable for domestic and industrial use. Ground water containing 1000-2000 p.p.m. of dissolved salts can be brought down to 400-500 p.p.m., which is sufficiently low for drinking purposes. Two thousand gallons can be treated daily. *Chem. Age* 57, 694 (1947).

Electrolyte-resistant Agents

The normal and acid sodium salts of the sulfuric ester of 10 hydroxystearic acid are very resistant in aqueous solution to the formation of turbidity on addition of various electrolytes. The prevalent view is no longer tenable that the turbidity of sulfated oil, caused by the addition of hard water, is due to the carboxyl radical in the sulfuric acid ester of the fatty acid. K. Nishizawa, *J. Soc. Chem. Ind.* Japan 44, 857-60; through *Chem. Abs.*

Cleaners for Printers

The problem of cleaning materials for the printing plant is discussed briefly in the March issue of *American Pressman*. Based on the experience of the writer at Pressmen's Home, Tenn., the following observations on cleaners are made. "The liquid cleaner that is used without water probably means paste type waterless hand cleaner has not met with general approval because of the amount of paper or cloth . . . required to remove dirt. Liquid soaps have not been found generally satisfactory for the print shop. What is frequently termed as a sand soap is still used extensively and does a fair job. Soap paste is extremely popular because it does a cleaning job that is not surpassed by any other product."

F. A. from Hydrolysis

The concentration of fatty acids present in soap solutions from hydrolysis was found to be less than the saturation concentration as determined experimentally. The solubilities range from 359 x 10^{-6} Molar for capric acid to 2.1 x 10^{-6} Molar for stearic acid at 25° C. The solubility of lauric and myristic acids is approximately doubled by an increase in temperature from 25 to 50° C.; that of capric palmitic, and stearic acids increases by 25-40 per cent. L. M. John and J. W. McBain, *J. Am. Oil Chemists' Soc.* 25, 41-41 (1948).

Tall Oil Constants

The acid numbers of seven commercial samples of tall oil, based on potentiometric titrations, varied from 154.5 to 169.0 These values are slightly different from those by the regular A.S.T.M. method, by which visual end points are difficult to read, as shown by the variation in the results of cooperative tests. Saponification numbers were 168.1-82.7 by the potentiometric method, and rosin-acid numbers were 51.8-58.0 The end point for acid and saponification numbers was pH 11.0, and for rosin-acid numbers pH 6.0 and 11.0 O. C. A. Snell J. *Am. Oil Chem. Soc.* 25, 103-4 (1948).

Seal Oil Fatty Acids

Preliminary crystallization of the mixed fatty acids of marine animal oils from acetone at —60° C., followed by ether at —30° or —40°, resolves them into groups differing widely in unsaturation. The groups can then be esterified and fractionally distilled. The method has been applied to the component acids, and also the component glycerides, of the blubber oil of a gray seal. The composition of the fatty acids of seal blubber oil varies over a somewhat wider range than obtains in the fatty oils of some other marine species. T. P. Hilditch and S. P. Pathak, *J. Soc. Chem. Ind.* 66, 421-5 (1947).

Glycerine Substitute

"Glycerogen" was manufactured in Germany as a substitute for glycerine, by the continuous hydrogenolysis of invert sugar. The I.G. Farbenindustrie produced about 250 tons of this a month, according to a report released recently. The product consists of about 35 per cent glycerol,

5 per cent glycols, and 25-28 per cent hexitol. The process applies continuous catalytic hydrogenolysis to sugar at 200° C. and a pressure of 325 atmospheres. *The Chem. Age 57*, 817 (1947).

Pyrene Antioxidant

A compound which inhibits oxidation and gumming of animal, vegetable, and fish oils, consists of a polycyclic aromatic hydrocarbon having at least 4 condensed rings combined in the form of a pyrene nucleus. E. A. Evans, J. S. Elliot, and Wakefield & Co., Ltd. British Patent No. 572,458.

Mildewproofing Agent

Pentahalophenyl ester of the formula C_6H_5OCOR is a superior type of mildewproofing agent. Similar compounds like the acetate or laurate can be dissolved in petroleum ether and applied to cotton fabric by padding. A. L. Houk, to Rohm & Haas Co. U. S. Patent No. 2,430,017.

Lemongrass Oil

Stocks of Indian lemongrass oil moved during the 1946-7 season were estimated at 520 tons, the chief purchasers being Great Britain and the United States. Carry-over stock at the beginning of the 1947-8 year is estimated at 32 tons.

The Travancore Government has recently sanctioned a 5-year scheme for the establishment of a lemongrass experiment station for study and development of superior stocks of lemongrass. *Chem. Trade J. & Chem. Engineer 122*, 12 (1948).

Color Reversion in Oils

The absorption spectra of crude cottonseed oil can be used as a basis for predicting the rate at which bleach color will develop during storage of crude oils. Such oils having a single absorption maximum at 368-370 millimicrons will develop high bleach colors rapidly. Such oils should be refined and bleached as rapidly as possible. Only oils of initially low pigment content can be stored for long periods at temperatures as high as 70°F. without development of excessive bleach color. P. A. Williams, C. H. Boatner, C. M. Hall, R. T. O'Connor, and L. E. Castillon, *J. Am. Oil Chemists' Soc. 24*, 362-9 (1947).

Antioxidants in Palm Oil

Two antioxidants in addition to tocopherol were isolated from the unsaponifiable matter of a sample of palm oil. A second sample of palm oil yielded different resuts. P. Dubouloz, M. J. Lagarde, and J. Laurent, *Oleagineux 2*, 242-6; through Chem. Abs.

Ultrasonic Radiation

Commercial oleic acid subjected to ultrasonic radiation showed a decrease in iodine number and an increase in hydroxyl value. This indicates that the effect is one of oxidation. Audouin and Mme. Audouin, *Olegineux 2*, 260; through Chem. Abs.

Tylose a Detergent Aid

A product made in Germany called "Tylose HBR" proved very useful in combination with synthetic detergents. For washing white glasses, the following formula was used:

	Per cent
Synthetic detergent	5-7
Soda ash	40
Waterglass, 40° Be.	3
Tylose HBR	3
Water	49-47

"Tylose HBR" is the sodium salt of the glycolic ether of cellulose, prepared from bleached sulfite pulp sheet from pine, or less frequently from beechwood. Demonstrations have shown that addition of one gram per liter of "Tylose HBR" to a suitable concentration of synthetic detergent such as an alkyl aryl sulfonate, is the equivalent of an effective concentration of soap in washing powder. Before this, no synthetic detergents had ever been found to work completely satisfactorily on cottons when used alone. Other cellulose derivatives such as the methyl ether, or the methyl hydroxy ethyl ether, do not add in the same way to the colloidal and washing properties of synthetic detergents. "Tylose HBR" has little or no washing or dispersing power of itself.

Production of "Tylose HBR" by the Kalle Company in crude and refined forms reached 120 tons per month during the war. At the end of the war plans existed for construction of a plant at Hochst to produce 30,000 tons a year. A small per cent of "Tylose HBR" also greatly improves the washing ability of "Mersol" and "Igepon T." For example, a soap powder made by the I.G. Farbenindustrie for wholesaling, had the following formula:

	Per cent
Igepon T, 100%	5
Soda ash	35
Tylose	4.5
Sodium silicate	5
Sodium sulfate	50.5

Crude "Tylose" contains sodium bicarbonate to reduce the alkalinity; refined "Tylose" is neutralized with hydrochloric acid, filtered, and pressed. "Tylose HBR" was made from 88 per cent bleached sulfite pulp sheet. This was mercerized with 18-22 per cent caustic soda for 1-1.5 hours at room temperature, then pressed as dry as possible in a nickel press. The alkali cellulose was shredded and reacted with sodium monochloroacetate at 35-8 per cent in a ratio of 100-75. This took several hours and was completed in a revolving drum. *Ind. Chemist 24*, 108-17 (1948); from CIOS Reports XXVI-2 and XXX-10 and BIOS Reports 711 and Misc. 11.

Scouring Wool Raw Stock

The physical and chemical properties of an alkyl aryl sulfonate type of synthetic detergent, lend themselves conveniently and economically to the scouring of all types of wool and mohair raw stock. Improved analytical methods for the determination of this synthetic detergent have been very helpful in establishing proper scouring controls and have allowed for extreme simplification of the wool raw-stock scouring process. In most instances the foam produced by the synthetic detergent on the surface of the scouring solution provides a sufficiently accurate control for detergent concentration. Alkali concentrations may be controlled by periodic pH measurements. Use of a constant feed of slightly causticized soda-ash stock solution is recommended for the control of bicarbonate alkalinity.

Scouring of pulled wools, which contain appreciable quantities of lime, is greatly simplified by the use of the sulfonate detergent, and scouring costs are reduced. O. M. Morgan, *Am. Dyestuff Reporter 37*, 96-9 (1948).

Copper on Fabrics

Formation of copper soaps in the presence of aqueous ammonia gives efficient fungicides for the treatment of fabrics. Copper or its carbonate or hydroxide is used as a starting material. The copper is dissolved in aqueous ammonia and made to react with naphthenic acid, oleic acid, benzoic acid, or hydrogenated rosin. If less than stoichiometric quantities are used of the acid, the resulting basic soap is just as effective. Volatile organic amines such as monamyl amine or triethyl amine can be used instead of ammonia. L. Roon to Nuodex Products Co., U.S. Patent No. 2,423,619.

Soap Preferences

Member newspapers of the Illinois Daily Newspaper Markets made a survey of from 5,000 to 100,000 families on the question of soap preferences. The results have been assembled and compiled under several headings as follows:

	Preference in %
Synthetic Detergents	
Dreft	64.1
Vel	31.6
Breeze	4.8
Swerl	3.9
Laundry Soap	
Oxydol	23.7
Rinso	19.8
Duz	18.6
Fels Naptha Bar	11.9
American Family Flakes	10.4
Super Suds	6.3
Others, less than 5% each	
Soap for Dishes	
Dreft	26.5
Vel	15.9
Ivory Bar	10.1
Duz	7.8
Ivory Flakes	7.3
Rinso	5.5
Oxydol	5.4
Others, less than 5% each	
Soap for Fine Fabrics	
Lux Flakes	25.6
Dreft	25.1
Ivory Flakes	18.7
Vel	10.7
Ivory Snow	6.3
Ivory Bar	5.4
Others, less than 5% each	
Cleaning Soap	
Spic & Span	63.1
Soilax	12.8
Others, less than 5% each	
Bath Soap	
Lux	20.5
Palmolive	17.5
Ivory	15.5
Lifebuoy	14.5
Sweetheart	10.6
Camay	9.1
Others, less than 5% each	
Face Soap	
Lux	24.9
Palmolive	17.8
Ivory	12.6
Camay	11.9
Sweetheart	11.5
Woodbury	7.2
Cashmere Bouquet	5.9
Others, less than 5% each	
Liquid Shampoo	
Drene	23.9
Halo	21.1
Fitch	10.1
Kreml	5.7
Others, less than 5% each	

Am. Perfumer 51, *No.* 1, 63-4 (1948).

Method for Iodine Number

The method of Kaufmann is much faster and more suitable for semicro work than the official method of Hanus. The Kaufmann method is reasonably reliable. L. Thayer and B. Glass, *Proc. Louisiana Acad. Sci.* 10, 213-5.

SANITARY PRODUCTS

A SECTION OF SOAP

WITH the assistance of some of the larger manufacturers of insecticides, the U. S. Junior Chamber of Commerce has been furthering a countrywide "Fly-Free America" campaign. Already this year, local efforts in some cities have brought forth effective radio and newspaper publicity. That this is designed to make the public fly conscious in advance of the main fly-breeding season, to drive home the idea of the dangers of fly-borne diseases and to arouse the desire to attack the fly problem early are indications of good planning.

Because it is essentially a project in behalf of the public health, the thoughts of large-scale fly control are probably uppermost in the minds of those sponsoring the campaign. Nevertheless, the opportunity is there also for every manufacturer of insecticides to tie-in his own sales efforts with the work in his own community, or to follow it up with special sales tactics. Whether he sells small package insecticides or drums for institutional and industrial uses, this campaign presents the opportunity to sell more insecticides for those who will make the effort. "Fly-Free America" is a timely, commendable idea,—but it can only help the sales of those who take the trouble to cash in on it.

THAT the Federal Trade Commission has been doing more than lifting an eyebrow in the matter of floor wax advertising and label claims is apparent to the trade. A preliminary conference with the FTC by a group of manufacturers in April at Washington was held to initiate a discussion of trade practices. Waterproof, non-slip, and long-wear claims are the main bones of contention. To those who are familiar with its method of operations, the atttitude of the FTC is no secret. At the current NAIDM meeting at Spring Lake, N. J., this whole subject is scheduled to be brought up for open discussion at a special floor wax conference. The findings of this conference will be interesting to note in the light of future floor wax claims.

SCIENTISTS are worried over the "perils of DDT." And not only DDT, according to Dr. James A. Curran of the American Museum of Natural History, but about some of the older insecticides also. We are beginning to find out things that "make us pull up short," he says. And the good doctor, in a recent newspaper interview, goes on to tell of the dangers of arsenic, and then adds that "DDT is essentially much stronger than arsenicals." Just what he means by "stronger" is somewhat vague. Maybe DDT has bigger muscles than arsenic, rotenone, or pyrethrum.

Although we must admit that science still has something to learn about DDT and all other insecticides as well, particularly their long range effects on man, animals, insects and crops, we are constrained to point out to Dr. Curran some of their good points which he apparently overlooks completely as he views their perils with alarm. Must we mention again the experience of the U. S. Army with typhus in Italy? Must we mention plague, malaria, yellow fever and other insect-borne diseases, century-old scourges of mankind? Must we go into the twenty-five year history of household insecticides, and their contribution to the public health? Must we detail all the benefits to man of chemical insect control?

So, if it comes down to "viewing with alarm," we have our fears as well as Dr. Curran. His newspaper implications on the "perils of DDT" and other insecticides may scare people away from them and their obvious benefits. A sharp knife or an automobile may under some conditions be weapons dangerous to man, but their general usefulness far outweighs any potentialities as a social menace. Dr. Curran's newspaper warning, we feel, was a trifle lopsided.

TOXICITY OF DDT RESIDUES

By R. W. Fay, E. L. Cole and S. W. Simmons, (U. S. Public Health Service)[1]

ALTHOUGH considerable work on the residual toxicity of DDT - xylene emulsion on various surfaces has been done (1), questions concerning new types of surfaces have necessitated an extension of the study. Since DDT-kerosene solutions and suspensions of water-wettable DDT are now rather widely used, the laboratory study was extended to include the residual effectiveness of these types of DDT formulations on specified surfaces.

In the care of homes, various maintenance operations such as dry-cleaning, washing and ironing, waxing, vacuum-cleaning, and brushing are applied frequently to DDT-treated surfaces. A laboratory study was made to determine the effect of these maintenance operations on the residual toxicity of DDT deposits.

The following factors were investigated in the laboratory: (1) The relative effectiveness of DDT-xylene emulsions on specified surfaces; (2) the comparative effectiveness of DDT deposits from emulsion, solution and suspension applications on specified surfaces; and (3) the effect of cleaning operations on the residual toxicity of DDT deposits.

Procedure

The technique and its modifications have been described previously (2) (3). In brief, a sample containing approximately twenty-five, four-day-old, insectary-reared, adult *Anopheles quadrimaculatus* females, was transferred from a stock cage to a glass lantern-chimney. The mosquitoes were then gently blown from the chimney into an exposure chamber composed of a rectangular wooden framework into which four, 3-by 12-inch test panels were inserted to form the sides. These panels had been previously sprayed as a single flat surface on one square foot. The ends of the chamber framework had circular openings to permit the introduction and removal of test insects.

After 60-minute exposure periods, the mosquitoes were blown into a wire holding-cage and provided with food and water. The immediate knock-down of the females and the 24-hour mortality of each sex were recorded. The same procedure was followed with control samples, except untreated panels were used in the exposure chamber. Any mortality in the controls was taken into account in the evaluation of the results. There being some variation among successive batches of insectary-reared mosquitoes, it was considered desirable to make some adjustment for the mortality in untreated checks from each batch. The method selected was to calculate the percentage kill by the

$$\text{formula } \frac{D - E}{T - E} \times 100$$

in which T was the total number of mosquitoes in the test; E, the number of dead expected in a control run of size T; and D, the number of dead mosquitoes in the test run. Both sexes were used in the tests, as separation of the sexes previous to testing was cumbersome, but only the mortalities of the females are considered in this paper. There are two reasons for this: (1) Females are more resistant to DDT, and (2) they are of importance in disease transmission.

In presenting the chronological data graphically, a smoothing formula (based on the assumption that short portions of the curve approach a straight line) was used as follows:

$$B^1 = \frac{A + 2B + C}{4}$$

in which B^1 was the corrected point as plotted; A, the reading of the previous period; B, the reading to be corrected; and C, the reading of the following period. Appropriate modification of this formula was used for the first and last points. The symbols A, B, and C represent the average of two or more runs in every case.

Relative Effectiveness of DDT-Xylene Emulsions on Specified Surfaces

Experimental Technique: in determining the residual toxicity of DDT-xylene emulsion on types of surfaces not previously tested, several series of panels were sprayed with a 5-percent emulsion at the rate of 200 mg. DDT per square foot. A xylene-"Triton X—100 [2]" concentrate containing 35 percent DDT was diluted with 1:6 water. This was applied with a hand sprayer at constant air pressure, and duplicate tests of 30- and 60-minute exposures were made at intervals after spray application.

As an extension of the series of surface types previously tested and described (1), panels were prepared to test three general types of surfaces, namely: Exterior surfaces represented by rusty and new samples of both sheet metal screen, cement, dry bamboo, bark, and palmetto thatch; interior surfaces represented by tile, glass, plastics, and shellacked wood; and fabric surfaces represented by rayon, nylon, and celanese.

At the time of spray application, an effort was made to duplicate, as closely as possible, actual field conditions with the various panel materials. The metal screen and fabrics were sprayed on open frameworks to simulate screens and draperies, and allowed to dry thoroughly before being mounted on wooden backing for test-

[1] From Communicable Disease Center, Technical Development Division (Savannah, Ga.) R. W. Fay, Senior Assistant Sanitarian; E. L. Cole, Entomologist; S. W. Simmons, Scientist.

[2] Triton X-100 is an emulsifier produced by Rohm and Haas Co., Phila.

Effect of surface and surface treatment on the residual toxicity of DDT against adult Anopheles Quadrimaculatus mosquitoes

ing. Previous to spray application, the dry bamboo was split and nailed on wooden panels and the dry palmetto fronds were woven to simulate thatch, and glued to panels. The shellacked wood was allowed to dry 45 days and one set of panels was then waxed and polished the day before being sprayed. All other materials were nailed or glued on wooden panels for testing.

Plain, pine plywood treated with 200 mg. DDT per square foot, was used as a standard in these tests since it is quite uniform and had been used as a standard in previous work (1).

Results: From the results obtained, the surfaces were divided into three groups: Those surfaces with a residual toxicity equal to or better than the standard; those with residual toxicity approximately three-fifths to four-fifths as efficient; and those with residual toxicity three-fifths or less as efficient as that of the standard.

With 60-minute exposure periods, the standard pine plywood panels gave laboratory mortalities of *A quadrimaculatus* females of at least 90 percent for the first 23 weeks, and after 35 weeks still caused mortalities of approximately 60 percent.

Somewhat better results were obtained for the same period from comparably treated dry bamboo and rusty metal-screen panels. Approximately equal results were obtained from the rusty sheet-metal panels, and the bark panels for the period during which they were tested (table 1).

Mortalities obtained from similarly treated new sheet-metal, glass, and tile were approximately three-fifths to four-fifths as high as those from the plywood standard. The palmetto-thatch, for the period tested, was also in this same group (table 1).

New metal screen, plexiglass, shellacked wood, rayon, celanese, and nylon gave results apprximately two-fifths to three-fifths as food ts the standard (table 1). The results obtained on the fabrics were very similar and have been averaged to give the results presented in the table under "synthetic fabrics." Low mortalities, approximately two-fifths or less than that of the plywood standard, were obtained on cement and waxed wood.

It is interesting to note that all the surfaces which gave results equal to or better than the standard were relatively rough surfaces which might aid in giving a good spray coverage and adherence. All of the second group, however, had continuous but very smooth surfaces which made it difficult to obtain good coverage since the emulsion spray separated into discrete droplets. Those surfaces

Figure 1. Twenty-four-hour mortalities (percent) of *A. quadrimaculatus* females after 60-minute exposure periods to deposits of 200 mg. DDT per square foot applied on natural and synthetic fabrics.

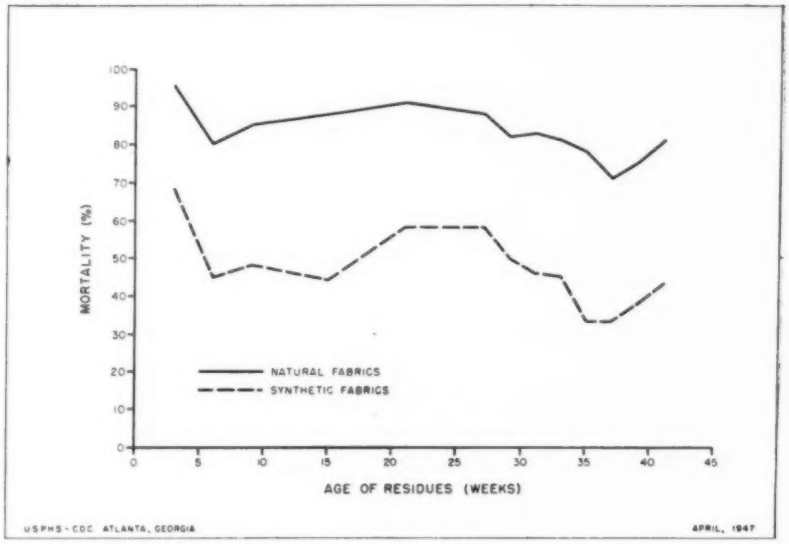


TABLE 1. Twenty-four-hour mortality (percent) of adult female A. quadrimaculatus after 60-minute exposure periods to deposits of 200 mg. DDT per square foot from applications of a DDT-xylene emulsion on different surfaces.

Type of Treated Surface	AGE OF RESIDUES (WEEKS)											
	5	9	15	23	25	27	29	31	33	35	37	39
Pine Plywood (Standard)	93	89	91	94	81	69	69	60	56	64	71	72
Dry Bamboo	96	93	100	98	90	85	92	96	88	86	88	88
Rusty Metal Screen	99	98	99	99	93	84	85	92	85	78	83	91
Rusty Sheet Metal	98	92	81	79	85	86	90	92	81	76	83	90
Bark	—	90	86	88	—	87						
New Sheet Metal	84	79	64	51	54	67	71	69	69	57	62	58
Glass	77	77	77	75	71	74	09	85	85	53	89	73
Tile	78	72	77	89	84	70	69	64	50	58	70	53
Palmetto Thatch	—	71	82	75	—	74						
New Metal Screen	98	90	79	65	46	30	37	51	42	38	42	36
Plexiglass	50	56	70	70	59	59	59	57	36	34	42	44
Shellacked Wood	—	74	70	40	23	21	39	—	—	—	—	—
Synthetic Fabrics	68	48	44	58	—	58	50	46	45	37	33	38
Cement	55	37	35	44	31	16	10	—	—	—	—	—
Waxed Wood	—	21	37	19	—	—	—	—	—	—	—	—

TABLE 2. Twenty-four-hour mortality (percent) of adult female A. quadrimaculatus after 60-minute exposure periods to deposits of 200 mg. DDT per square foot from applications of a DDT-kerosene solution on different surfaces.

Type of Treated Surface	AGE OF RESIDUES (WEEKS)											
	5	9	15	23	25	27	29	31	33	35	37	39
Pine Plywood (Standard)	84	78	77	79	69	59	47	33	42	58	67	63
Rusty Sheet Metal	77	80	85	84	78	76	82	83	75	73	80	82
Dry Bamboo	72	73	73	70	56	47	63	67	42	39	64	70
Plexiglass	81	77	76	72	54	44	54	56	42	44	62	69
Green Bamboo	80	70	59	49	38	36	48	52	39	36	46	46
New Metal Screen	75	62	49	40	24	8	—	—	—	—	—	—

TABLE 3. Twenty-four-hour mortality (percent) of adult female A. quadrimaculatus after 60-minute exposure periods to deposits of 200 mg. DDT per square foot from applications of a water-wettable DDT suspension on different surfaces.

Type of Treated Surface	AGE OF RESIDUES (WEEKS)								
	5	11	19	23	27	29	31	33	35
Cement	98	87	85	76	90	85	70	57	54
Glass	90	78	70	84	90	84	67	68	75
New Sheet Metal	94	84	70	78	89	91	88	83	70
Tile	90	78	70	79	76	74	64	57	60
Dry & Green Bamboo	91	76	64	79	93	84	69	72	80
Pine Plywood (Standard)	84	—	62	—	60	48	48	—	36
Palmetto Thatch	77	64	54	67	61	67	65	66	68
Rusty Metal Screen	79	71	42	41	22	25	—	—	—
Bark	57	—	35	15	—	—	—	—	—
Simulated adobe	12	4	—	—	—	—	—	—	—

TABLE 4. Twenty-four-hour mortality (percent) of adult female A. quadrimaculatus from 60-minute exposure periods to deposits of 200 mg. DDT per square foot which had been subjected to different cleaning and maintenance operations.

Type Surface	Surface Treatment	NUMBER OF TESTS										
		0	1	2	3	4	5	6	7	8	9	10
Rayon	None	78	54	54	—	—	—	—	—	—	—	—
	Dry-cleaned	52	24	10	—	—	—	—	—	—	—	—
Celanese	None	47	37	46	—	—	—	—	—	—	—	—
	Dry-cleaned	42	35	21	—	—	—	—	—	—	—	—
Nylon	None	79	49	32	—	—	—	—	—	—	—	—
	Dry-cleaned	57	50	19	—	—	—	—	—	—	—	—
Mohair	None	98	87	90	—	—	—	—	—	—	—	—
	Dry-cleaned	93	27	8	—	—	—	—	—	—	—	—
Cotton Goods	None	99	80	92	92	—	—	—	—	—	—	—
	Dry-cleaned	97	90	45	6	—	—	—	—	—	—	—
Cotton Goods	None	94	83	87	88	—	—	—	—	—	—	—
	Wash only	94	78	62	20*	—	—	—	—	—	—	—
	Wash-iron	93	36	20	11	—	—	—	—	—	—	—
Chintz	None	94	76	83	92	88	82	76	69	66	—	—
	Sponge-iron	100	77	79	58	59	61	41	19	10	—	—
Mohair	None	98	86	88	90	91	88	80	82	82	84	72
	Brushed	72	81	53	38	22	23	—	—	—	—	—
	Vacuum Cl.	100	77	74	75	73	72	62	41	56	28	10
Shellacked Wood	None	70	50	37	—	—	—	—	—	—	—	—
	Dusted	32	19	13	—	—	—	—	—	—	—	—
Wallpaper	None	99	98	98	99	95	85	87	92	89	—	—
	Dusted	92	77	53	40	38	30	24	32	37	—	—
	Paste Clean	86	59	38	22	13	—	—	—	—	—	—
Wood (plain)	None	70	50	37	42	40	—	—	—	—	—	—
Wood (wax)	None	21	37	28	13	—	—	—	—	—	—	—
	Wax-polish	17	13	—	—	—	—	—	—	—	—	—
Linoleum (plain)	None	1	1	—	—	—	—	—	—	—	—	—
Linoleum (waxed)	Wax-polish	15	9	—	—	—	—	—	—	—	—	—

*Ironed as well as washed on third test.

that were not more than three-fifths as effective as the standard were either smooth discontinuous surfaces such as the synthetic fabrics and the new metal screen, or else materials such as shellac or wax, the surface of which might be temporarily softened and penetrated by the xylene in the emulsion, and later, upon drying, trap a quantity of the DDT. The low residual effectiveness of the spray application on cement may well be due to the high porosity of this surface.

Although the initial residual toxicities of DDT on fabrics composed of animal or plant (natural) fibers and plastic (synthetic) fibers was markedly different (figure 1), there was a similar relative loss of residual toxicity upon aging. Since there was no visible physical damage, it is somewhat doubtful that the emulsion had solvent action on the plastic fibers, but rather that the smooth synthetic fibers did not offer as good a surface for the adherence of droplets as did the roughest natural fibers.

Comparative Effectiveness of DDT-Deposit From Emulsion, Solution, and Suspension Applications on Specified Surfaces

Although the more detailed studies on the residual effffectiveness of DDT on different surfaces have been based on the DDT-xylene emulsion deposits, more limited studies have been made on other types of DDT formulations Two other types considered were (1) DDT-kerosene solutions and (2) water-wettable DDT powders. This choice was made because kerosene has often been the most readily available DDT solvent in many parts of the world, and because the water-wettable DDT suspensions have been extensively used in locations where appearance of the sprayed surface was not of prime consideration.

Experimental Technique: The DDT-kerosene solution was tested on panels of new metal screen, rusty sheet metal, plexiglass, and green and dry bamboo. These surfaces were selected on the basis of prior need for such information. A single water-wettable powder was used to formulate all suspensions, and tests were made on new sheet metal, glass, dry and green

bamboo, tile, bark, palmetto thatch, and simulated adobe. Plain plywood was used as a standard in both studies.

All panels were made as previously described with the exception of the simulated adobe. Alluvial clay, which had been silted by natural tidal action on pilings, was used for this, after screening to remove extraneous matter. A clay slurry was poured into molds large enough to allow for a predetermined shrinkage, dried for two months at room temperature, and then the clay blocks were backed with plywood for testing. This surface was included because previous studies had shown the DDT-xylene emulsion to be inexective on simulated adobe (1), and it was thought that the water-wettable DDT might have more residual effectiveness.

Results: With the exception of plexiglass, the comparative effectiveness of the DDT-kerosene deposits on the surfaces tested presented much the same relative picture (table 2) as did the DDt-xylene deposits. The DDT-kerosene deposits showed a high degree of effectiveness on the rusty sheet metal, progressively less on the pine plywood, dry bamboo, plexiglass, and inferior effectiveness on the green bamboo and new metal screen.

The water-wettable DDT deposits (table 3) showed definite superiority to the DDT-xylene deposits on the absorbent surface of cement, and somewhat better results on the smooth surfaces of new metal and glass. The results on tile and on dry and green bamboo were very similar to those obtained for emulsion deposits (table 1). The effectivenes of water-wettable DDT was less on plywood and palmetto thatch. In further comparison to the DDT-xylene deposits, the water-wettable DDT gave decidedly inferior results on rusty metal screen, and bark surfaces. The results on simulated adobe were disappointing as no residual effectiveness was obtained, even though visual evidence indicated an adequate treatment.

Effect of Cleaning Operations on the Residual Toxicity of DDT Deposits

As previously reported (1), 5-percent-DDT xylene emulsion could be safely applied at the rate of 4 cc. or 200 mg. DDT per square foot without damage to fabrics such as cotton, mohair, and wool. If over-application was avoided, the DDT-xylene emulsion could be applied safely to wallpaper with the exception of certain light blue and light green shades. On gloss enamels and rubbing varnish surfaces, the application of emulsion caused some clouding of the gloss, but in uniform applications this was not particularly noticeable.

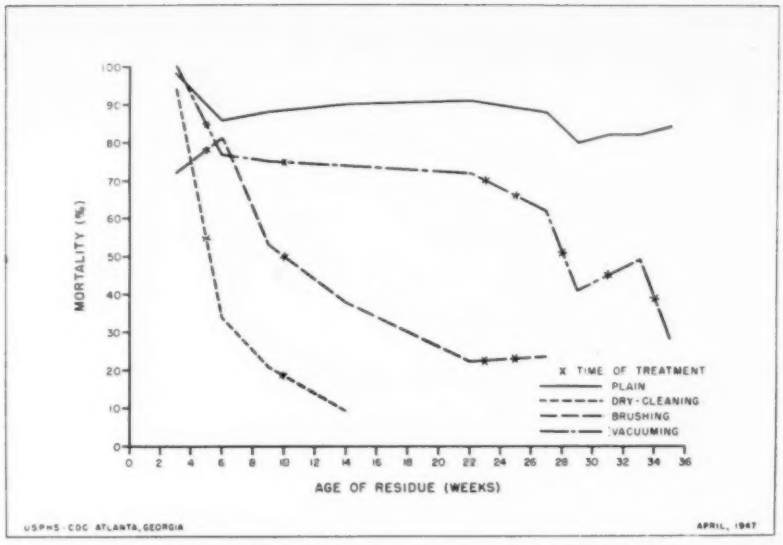


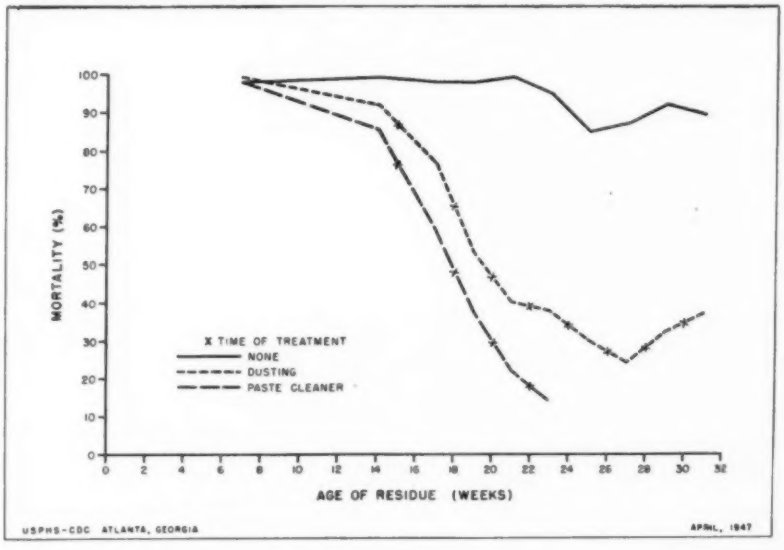
Figure 2. Twenty-four-hour mortalities (percent) of *A. quadrimaculatus* females after 60-minute exposure periods to deposits of 200 mg. DDT per square foot applied on mohair which received various subsequent cleaning treatments.

In residual house spraying, DDT emulsion is applied to a wide variety of surfaces in addition to the walls and ceilings, and a study was initiated to determine the effects of household and cleaning maintenance operations upon residual toxicity.

The cleaning operations have been considered in three general categories, namely: (1) The use of liquid cleaners such as mineral spirits for dry-cleaning oylon, rayon, celanese mohair and cotton slip-cover material, soap and

(*Turn to Page 157*)

Figure 3. Twenty-four- hour mortalities (percent) of *A. quadrimaculatus* females after 60-minute exposure periods to deposits of 200 mg. DDT per square foot applied on wallpaper which received various subsequent cleaning treatments.



N. A. I. D. M. Meets at Spring Lake, N.J.

MEMBERS of the National Association of Insecticide and Disinfectant Manufacturers opened their 34th annual mid-year meeting at the Hotel Monmouth, Spring Lake, N. J., June 14, with a program scheduled to highlight the new post-war emphasis on sales planning and product development. A three day program of addresses and open forums was scheduled, with sufficient time left free to allow for a number of special group meetings. The program for the meeting was arranged by a committee headed by Friar Thompson of R. J. Prentiss & Co., New York. Other committee members include Melvin Fuld of Fuld Brothers, Baltimore; John Powell of John Powell & Co., New York; C. A. Lawrence of Winthrop-Stearns, Rochester; C. L. Weirich of C. B. Dolge Co., Westport, Conn.

Sunday afternoon, the day before the official convention opening, was to be given over to a series of committee meetings, with the board of governors to follow with a dinner session. On Monday morning the convention opened with a welcome to members and guests by Gordon M. Baird of Baird & McGuire, Holbrook, Mass., N.A.I.D.M. president. Talks on marketing were the feature of this session, including an address by E. G. Freedman of R. H. Macy & Co., New York, on "Trends in Consumer Demand for Household Products in the Sanitary Field" and one by Dr Edward C. Bursk, Harvard University, on "Method of Marketing A New Sanitary Chemical or Sanitary Chemicals." Also scheduled for the first session was an open floor discussion on an important association problem, topic not announced in advance. The report of the secretary, delivered by H. W. Hamilton, accompanies this advance account of the meeting.

Additional committee meetings were scheduled for Monday afternoon, and a card tournament for Monday evening, with L. J. Oppenheimer of West Disinfecting Co. in charge.

The Tuesday morning session listed "Pine Oil in Scrub Soaps" by A. B. DuBois of Fuld Bros., and "Selling Cleanliness and Sanitation" by W. W. Peter, M.D., Division of Health and Sanitation of the Institute of Inter-American Affairs. "Operation of the New Federal Insecticide Act" was to be discussed by W. G.

DR. W. W. PETER
"Selling Cleanliness and Sanitation"

GORDON M. BAIRD
N.A.I.D.M. President

DR. EDWARD C. BURSK
"Marketing a New Sanitary Chemical"

FRIAR THOMPSON
Program Chairman

Reed, chief, Insecticide Division, Production and Marketing Adm., U.S.D.A., with Dr. Roger B. Friend, Connecticut state entomologist, to talk on "Work of Chemical-Biological Coordination Center of National Research Council."

At luncheon, N.A.I.D.M. members were to see a color film, "Better Livestock," prepared and presented by the National Livestock Loss Prevention Board. At the afternoon session active open floor discussion was looked for on the appropriate topic "What Has Happened to the Insecticide Business?" with Ira P. MacNair of MacNair-Dorland Co. acting as moderator. Harold Noble of S. B. Penick & Co. was to report on the national "Rat Control Program," and Dr. C. R. Twinn, Canadian Department of Agriculture, giving a "Pictorial Presentation of Joint United States-Canadian Biting Fly Studies at Churchill." Also scheduled for this session was a second open floor discussion involving an important matter of association policy.

A group meeting for manufacturers of wax products was to constitute the afternoon session on Wednesday, with the proposed schedule of trade practices offered by the Federal Trade Commission due to be discussed. Melvin Fuld of Fuld Bros., and John D. Conner, N.A.I.D.M. legal counsel in Washington, were to act as moderators.

An afternoon of golf was arranged by the committee for Tuesday, with the annual N.A.I.D.M. golf tournament to be contested on the course of the Spring Lake Country Club. Other social features included a cocktail party and an informal dinner and floor show which was to bring the meeting to a close the evening of Wednesday, June 16.

Report of the Secretary

THE midyear meeting of our Association finds us assembled again for a three-day get-together. We have had three-day meetings before—we have met at resort hotels before. Should we continue three-day meetings, or revert to two-day meetings? Should all midyear meetings be held in the middle west? Should we have two meetings a year, or only one? Should the meetings be general, or product type of meetings? During the days we are here, let's discuss these subjects, seriously, in order to guide the Association officers.

During the past six months the Executive Office has been busy constantly with problems connected with the new Federal Insecticide, Fungicide, and Rodenticide Act, with state laws and with proposed new legislation. As June 25th approaches, more of our members realize that "registration day" will be here. I doubt if any one industry ever received the overhauling of products and labels that is now occurring in ours. The enforcement officials are being most cooperative, and as lenient as the law permits. The Executive Office has been keeping members informed all through the enactment of the legislation of what is being proposed. Interpretations and regula-

SUNDAY — JUNE 13, 1948

2:00 P. M. Association Suite Open for Advance Registration.

COMMITTEE MEETINGS

1:30 P. M. Insecticide Scientific Committee
A. C. Miller, Chairman.

2:00 P. M. Disinfectant Scientific Committee Chairmen
This is a meeting of subcommittee chairmen only; general Disinfectant Scientific Committee meeting will be held Monday afternoon.

3:00 P. M. Chemical Analyses—Insecticide Section
Dr. R. C. Haring, Chairman.

3:00 P. M. Sanitary Specialties Scientific
Melvin Fuld, Chairman.

3:00 P. M. Membership Committee
D. W. Lynch, Chairman.

3:00 P. M. Disinfectant Merchandising
J. A. Brereton, Chairman.

4:00 P. M. Associate Members
R. M. Stevenson, Chairman.

5:00 P. M. Board of Governors Meeting in Card Room.

7:00 P. M. Board of Governors Dinner.

9:00 P. M. Monday Night—Gin Rummy Tournament—June 14th

2:30 P. M. Tuesday Afternoon — Golf Tournament — June 15th at Spring Lake Country Club, Spring Lake, N. J.

Quoits Tournament—
Time and date to be arranged.

MONDAY—JUNE FOURTEENTH
MORNING SESSION
Gordon M. Baird, Presiding

9:00 A. M. Registration-Ballroom Foyer
9:30 A. M. Meeting called to order.

1. Welcome by President Gordon M. Baird, Baird & McGuire Inc.
2. Report of Secretary — H. W. Hamilton, H. W. Hamilton Co. Inc.
3. Roll Call
4. Appointment of Committees—Miscellaneous Reports
5. "Trends in Consumer Demand for Household Products in the Sanitary Field" — E. G. Freedman, Bureau of Standards, R. H. Macy & Co., New York.
6. An Association Matter of Great Importance.
7. "Method of Marketing a New Sanitary Chemical or Sanitary Chemicals" — Dr. Edward C. Bursk, Harvard Business Review, Harvard University, Cambridge, Mass.

12:30 P. M. Luncheon

MONDAY AFTERNOON
COMMITTEE MEETINGS

1:30 P. M. Sanitary Specialties Merchandising
John A. Marcuse, Chairman.

2:00 P. M. Disinfectant Scientific
Dr. Geo. F. Reddish, Chairman.

2:00 P. M. Aerosol
H. E. Peterson, Chairman.

tions are being sent out as rapidly as received. We again caution all to comply. The law should work to the benefit of every ethical manufacturer.

There have been a few new legislative proposals which would be restrictive. We have assisted in pointing out the undesirable points to members of the various state legislatures. The variations in state laws are numerous. The differences in regulations and other details continue to be a major problem. No one is more cognizant of this than the State and Federal officials. Recently a special committee of State officials gave their time for a week in Washington in an effort to work out these differences. The Insecticide Division, Production and Marketing Administration, U. S. Department of Agriculture sponsored this meeting and paid the expenses. I met them in Washington and I can tell you that they worked diligently.

The Association of Economic Poisons Control Officials, formed about a year ago, with its committees, and industry-cooperating committees, will all be of much benefit.

Speaking for industry which we represent, may I suggest that we take a look at these laws. *Fees*: if 48 states and their territories all get fees such as in the law just passed in Virginia, then there will be many complaints. The average firm will be paying *annually* over ten thousand dollars per year for registration, not counting office time. Yet, the average company has done very little, or nothing, to cooperate with us to combat this trend. A campaign must be started to abolish these fees. The nuisance of annual registration is enough of a burden. We must go out for the same type of five-year registration that we have in the Federal Law. We must have optional labeling of ingredients, and all other features of the laws should be uniform, fair and equitable. Get in and fight with us. It is your business. After a law is passed, revision is more difficult.

H. W. HAMILTON
N.A.I.D.M. Secretary

Last December your Board of Governors raised our dues. We have had some complaints—and two resignations because of this increase, but we still feel very definitely that the Board did the right thing. Costs have gone up all along the line. We must have more members; decrease our activities and services, or allow our reserve to increase, before any reduction in dues will be feasible.

All the offiers of your Association work without reimbursement. The only income of the Association consists of dues and, of necessity, our budget is limited. We do try to give you good service. Bulletins are sent out whenever there is anything of importance. These bulletins are issued on timely and important matters on which you should be informed; of the activities of the Association; your committees; and on facts to guide you in the particular fields of our industry. To get this data to you requires constant review of literature, correspondence, and direct contact with many federal and state agencies. Most individual members would not have the

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3:00 P. M. Public Purchases
R. O. Cowin Chairman.

4:00 P. M. Chemical Analyses — Disinfectant Section
W. A. Hadfield, Chairman.

4:00 P. M. Sprayer
H. E. Reinhardt, Jr. Chairman.

TUESDAY—JUNE FIFTEENTH
MORNING SESSION
L. J. Oppenheimer, Presiding

9:30 A.M. Meeting called to order.
Announcements

8. "Pine Oil in Scrub Soaps"—A. B. DuBois, Fuld Bros. Inc.
9. "Selling Cleanliness and Sanitation"—W. W. Peter, M. D., Dr. P. H., Chief Training Section, Institute of Inter-American Affairs, Division of Health and Sanitation, Washington, D. C.
10. "Operation of the New Federal Insecticide Act"—W. G. Reed, Chief, Insecticide Div., Production and Marketing Adm., U. S. Department of Agriculture, Wash. D. C.
11. "Work of Chemical-Biological Coordination Center of National Research Council"—Dr. Roger B. Friend, State Entomologist, New Haven, Conn.

12:30 P. M. Luncheon

9:00 P. M. Showing of color and sound film "Better Livestock"
through courtesy of Ray L. Cuff, Regional Manager National Livestock Loss Prevention Board.

WEDNESDAY—JUNE SIXTEENTH
MORNING SESSION
Gordon M. Baird, Presiding

9:30 A.M. Meeting called to order.
Announcements

12. "What Has Happened to the Insecticide Business?" Questions and Answers. Ira P. MacNair, Moderator.
13. "Rat Control Program Report"— Harold Noble, S. B. Penick & Co.
14. An Association Matter of Great Importance.
15. "Pictorial Presentation of Joint United States-Canadian Biting Fly Studies at Churchhill"—Dr. C. R. Twinn, Household and Medical Entomology Unit, Department of Agriculture, Ottawa, Canada.

12:30 P. M. Luncheon

WEDNESDAY—JUNE SIXTEENTH
AFTERNOON SESSION
C. L. Weirich, Presiding

2:30 P. M. Wax Products — Federal Trade Commission Trade Practices
Moderators: Melvin Fuld, Fuld Bros., Baltimore. John D. Conner, NAIDM, Washington.

6:00 P. M. Cocktail Party—Sun Porch

7:00 P. M. Informal Dinner and Floor Show.
Awarding of Prizes.

Residual Toxicity

Chlorinated camphene compared to DDT for toxic residual effects on various surfaces and in paints against the house fly[1]

By J. H. Beacher and W. L. Parker[2]

University of Delaware

SIMILAR insecticidal properties displayed by chlorinated camphene[3] and DDT, in laboratory investigations reported by Parker and Beacher,[4] led to further studies designed to compare their residual effects against the house fly, *Musca domestica* L., when these toxicants were applied to various surfaces and when incorporated in paints.

Surface Tests.—A duplicate series of cubical test cages, with inner dimensions of 16.25 inches, were prepared for this work. Four sides were covered with various materials which had been selected to simulate typical surfaces encountered when residual toxicants are employed for house fly control. These included pebbled glass, resembling a smooth, nonporous surface such as glazed tile; fir plywood, as unpainted wood; Celotex as an absorbent, porous surface; and masonite, which had received two coats of one of the following materials: Texolite #330 Gardenia White, washable oil, resin flat paint; whitewash (hydrated lime, 781 gms./gal. of water), in which the toxicants had been incorporated; and whitewash, which had been sprayed with the toxicants three days after application. The cage tops were covered with 16-mesh galvanized screen wire. Bottoms were formed by placing the cages on glass.

Comparable water-miscible formulations of both Toxaphene and DDT were used to prepare 10 per cent (by weight) emulsions. Each was atomized, at the rate of 100 mg. of toxicant per sq. ft., on the four cage-sides through a DeVilbiss #631 nozzle operating under 5 pounds pressure per sq. in. A control cage, with the four sides of window glass, was treated with an equal volume of the solvent (Shell E-407) and emulsifier (Tween G-1045), both used at the same concentration as in the other sprays. An untreated glass cage served as an absolute control. Cages were sprayed on December 14, 1946, and the first tests run on December 17, 1946. They were repeated at approximately monthly intervals until August 1, 1947. The temperature and humidity conditions of the room in which these tests were completed were

[1] Published as Miscellaneous Paper No. 46, with the approval of the Director of the Delaware Agricultural Experiment Station. Publication 218 and Scientific Article 140 of the Department of Entomology, February 10, 1948.

[2] Assistant Hercules Research Fellow and Hercules Research Fellow, Entomology, respectively.

[3] Toxaphene, trade-mark and patent of Hercules Powder Co.

[4] Parker, W. LeRoy, and John H. Beacher. Toxaphene, a chlorinated hydrocarbon with insecticidal properties. Del. Sta. Bul. 264, Feb., 1947, 1-27.

TABLE 1. — Hours required for complete knockdown of the house fly on various surfaces bearing a deposit of 100 milligrams of toxaphene or of DDT per square foot.

Age of Residue	HOURS REQUIRED FOR COMPLETE KNOCKDOWN OF THE HOUSE FLY ON VARIOUS SURFACES												
	Pebbled Glass		Unpainted Wood		Water Paint		Whitewash[1]		Whitewash[2]		Celotex		Smooth Glass
(in days)	Toxaphene	DDT	Toxaphene	DDT	Toxaphene	DDT	Toxaphene	DDT	Toxaphene	DDT	Toxaphene	DDT	Control[3]
3	5.0	0.4	10.3	0.5	10.5	0.6	7.1	0.4	9.0	0.5	9.2	0.7	24[5]
29	4.2	0.5	9.0	0.4	22[4]	0.4	22[4]	0.6	9.2	0.5	10.2	0.4	"
66	4.9	0.7	6.4	0.5	"	0.5	6.6	1.3	7.5	0.7	22[4]	0.6	"
98	4.5	0.6	6.0	0.4	"	0.4	6.5	1.0	6.0	0.9	"	0.6	"
121	6.0	0.9	6.0	0.8	"	0.5	6.2	1.1	6.3	1.0	"	0.7	"
153	3.8	1.0	4.1	0.4	"	0.5	5.0	1.4	5.1	1.2	"	0.7	"
194	6.0	3.3	6.2	0.4	"	0.4	6.3	6.5	6.2	4.2	7.0	1.4	"
225	7.0	1.7	5.9	0.6	0.6	0.5	6.6	3.6	6.7	3.7	22[4]	0.8	"

[1] Toxicant applied over whitewash
[2] Toxicant incorporated in whitewash
[3] Sprayed with solvent (Shell E-407) and emulsifier (Tween G-1045)
[4] Time required between 7 and 22 hours
[5] Time required in excess of 24 hours

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much the same as those found in normal heated homes.

Five-day-old house flies, reared as specified for the Peet-Grady Method, served as test insects. The flies were anesthetized and transferred to 250 ml. beakers. Upon resuming normal activity, they were released as random samples of 150 flies (males and females) into the test cages. A "free-choice" exposure method (that is, flies were permitted to alight on surface at will) was employed. In recording knockdown, flies remaining on their backs for ten seconds were considered "down". Food was supplied in the form of a 10 percent sucrose solution.

Following release of the flies into the cages, continuous observations were made to determine the total time required for 100 per cent knockdown (see Table 1). DDT proved superior to Toxaphene in speed of knockdown on all surfaces during the 225-day observation period. Ratings of these toxicants on the various surfaces for beginning and end of knockdown were in the following descending order: Toxaphene (pebbled glass, both whitewashed surfaces, unpainted wood, Celotex and water paint); DDT (unpainted wood, water paint, Celotex, pebbled glass and both whitewashed surfaces).

The effect of aging on the residual deposits of both Toxaphene and DDT, in relation to knockdown, varied considerably throughout the period of observations. An increase in the time required for complete knockdown was noted for Toxaphene on pebbled glass and Celotex surfaces, whereas this material on unpainted wood, water paint, and both whitewashed surfaces displayed a higher knockdown rate with aging. In the case of DDT, the rate of knockdown remained constant on unpainted wood, water paint and Celotex, but decreased with pebbled glass, and both whitewashed surfaces.

Comparative six-hour mortality data for all surfaces, presented in Table 2, indicate that Toxaphene requires more time than DDT to impart a lethal effect. Both toxicants showed a sharp reduction in mortality rates for all surfaces following initial testing, with the exception of DDT on Celotex. Ratings, on six-hour mortality were in the following descending order: Toxaphene (Celotex, both whitewashed surfaces, pebbled glass, Texolite water paint, and unpainted wood); DDT (both whitewashed surfaces, Celotex, Texolite water paint, pebbled glass, and unpainted wood).

Similar knockdown and six-hour mortality rates were recorded for both toxicants with the whitewashed surfaces; in other words, no difference was established between spraying the toxicant on whitewash or incorporating it in the whitewash.

During the 225-day observation period, both Toxaphene and DDT produced 100 per cent mortality of the house fly on all surfaces within twenty hours after release of the flies into the treated cages.

Paint Tests.—Three series of pine panels, coated with treated paints, were employed to establish a comparison of the residual effectiveness of Toxaphene and DDT when each toxicant was incorporated in such paints. Each panel was primed with an enamel undercoater. Then, two coats of various paints, treated with 5 per cent formulations of Toxaphene or DDT were applied twenty-four hours apart as follows: Series I—Paints applied immediately following addition of the toxicant, each coat being freshly prepared; Series II—Paints, containing toxicants, were aged in the cans for one week prior to application; Series III—Paints containing toxicants, were aged in the cans for one month prior to application.

Five types of paint were used; namely an oleoresinous enamel, an oleoresinous flat wall paint, a protein nonwashable water paint, a flat washable type, and a gloss washable type. Linoleum-covered panels, coated with floor wax containing 5 per cent DDT, were also observed for residual toxicity. Pine panels, coated with each of the aforementioned paints, but lacking the toxicants, served as checks.

These tests were conducted in cages of uniform dimensions, the treated surface of the panel (3″ x 10″ x 1.75″) providing an area one-fifth that of the total surface area of the interior of the cage. An average of 60, five-day-old house flies were exposed to the treated panels in a "free-choice" method for a period of 48 hours. Food was supplied in the form of a 10 per cent sucrose solution. The cages containing the panels were held in a room maintained at constant temperature of 78° F. (±1°) and a relative humidity of 60 percent (± 3%). The only illumination, to which the panels were indirectly subjected, was furnished by one 200-watt bulb.

Mortality rates could not be determined under the test conditions. Observations were limited, therefore, to knockdown, which was recorded 3, 24, and 48 hours after release of the

TABLE 2. — Comparative six-hour mortality data (in per cent) for house flies exposed to various surfaces bearing a deposit of 100 milligrams of Toxaphene or of DDT per square foot.

Age of Residue (in days)	SIX-HOUR MORTALITY (IN PER CENT) FOR HOUSE FLIES ON VARIOUS SURFACES												
	Pebbled Glass		Unpainted Wood		Water Paint		Whitewash[1]		Whitewash[2]		Celotex		Smooth Glass Control[3]
	Toxaphene	DDT	Toxaphene	DDT	Toxaphene	DDT	Toxaphene	DDT	Toxaphene	DDT	Toxaphene	DDT	
3	81	93	36	86	45	90	77	85	74	86	99	54	0
29	43	55	13	42	21	68	32	61	24	47	45	68	3
66	38	57	16	55	24	47	36	57	31	93	58	69	6
98	34	64	28	71	47	90	66	79	61	94	53	77	9
121	29	51	18	52	27	54	37	49	50	84	56	53	13
153	58	76	61	82	38	85	55	97	74	97	60	90	19
194	36	85	34	79	40	80	34	69	55	86	30	79	13
225	32	48	22	58	35	70	23	58	33	68	48	68	18

1 Toxicant applied over whitewash
2 Toxicant incorporated in whitewash
3 Sprayed with solvent (Shell E-407) and emulsifier (Tween G-1045)

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TABLE 3. — Hours required for initiation and completion of knockdown of the house fly by protein nonwashable water paint and washable flat wall paint containing 5 per cent of Toxaphene or of DDT.

Type of Paint	Toxicant	Knockdown (in hours)	AGE OF RESIDUE (IN DAYS)											
			44	60	67	76	105	123	130	137	204	221	228	236
Protein nonwashable water paint	Toxaphene	Began	4.7	3.4	5.4	5.2	22[1]	6.0	22[1]	22[1]	22[1]	4.0	3.8	6.0
		Complete	30 to 48 hours											
	DDT	Began	0.4	0.5	0.3	0.4	0.3	0.2	0.5	0.6	0.3	0.3	0.3	0.3
		Complete	2.2	2.2	2.2	2.4	2.0	2.6	2.8	3.5	3.0	3.0	5.4	4.7
Washable flat wall paint	Toxaphene	Began	5.3	5.2	22[1]	22[1]	22[1]	6.0	22[1]	22[1]	22[1]	4.3	24	22[1]
		Complete	30 to 72 hours											
	DDT	Began	0.5	0.4	1.0	1.4	0.3	0.3	2.8	3.0	0.3	0.2	3.7	5.8
		Complete	2.9	2.1	48[2]	48[2]	2.0	2.8	48[2]	48[2]	22[1]	48[2]	3.0	48[2]

[1] Time required between 6 and 22 hours
[2] Time required in excess of 48 hours

insects into the test cages. The panels of Series I and II, and of Series I and III were compared on three occasions during a period of eight months after preparation of the paints.

Between 6 and 30 hours were required for initiation of knockdown, and in excess of 48 hours for completion of knockdown, by both toxicants in the case of panels in all series treated with gloss water paint, oleoresinous enamel, and oleoresinous flat wall paint. Knockdown rates for protein nonwashable water paint and washable flat wall paint, containing Toxaphene and DDT, are set forth in table 3.

DDT was faster than Toxaphene in initiation and completion of knockdown, when included in protein nonwashable water paint and washable flat wall paint with all series of panels. In general, the effect of aging these treated paints did not cause a significant reduction in the knockdown effect.

Comparative residual toxicity data for Series I and II panels and for Series I and III panels, as summarized in Table 4, show the following trends: (1) Toxaphene produced a greater knockdown than DDT with oleoresinous enamel, oleoresinous flat wall paint, and gloss water paint; (2) DDT produced a greater knockdown with protein nonwashable water paint and washable flat wall paint; (3) Series I panels were more effective than Series II and III with oleoresinous enamel, oleoresinous flat wall paint, and gloss water paint; (4) Series II

(*Turn to Page* 163)

TABLE 4. — Comparative residual toxicity of Toxaphene and DDT in treated paints against the house fly.

Type of Paint	Age of Film (in days)			PER CENT KNOCKDOWN																
				3 Hours						24 Hours						48 Hours				
	Series			Toxaphene			DDT			Toxaphene			DDT			Toxaphene			DDT		
	I[1]	II[2]	III[3]	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Oleoresinous enamel	67	60		0	0		0	0		8	4		2	13		33	21		22	28	
	76		44	0		0	0		0	1		3	2		8	28		22	9		14
	130	123		0	0		0	0		4	4		0	0		27	25		7	5	
	137		105	0		0	0		0	5		1	2		0	15		16	4		5
	228	221		0	0		0	0		13	8		2	0		33	36		13	4	
	236		204	0		0	0		0	2		6	0		0	23		34	31		7
Oleoresinous flat wall paint	67	60		0	0		0	0		7	2		18	0		32	23		34	13	
	76		44	0		0	0		0	7		4	2		11	31		24	28		25
	130	123		0	0		0	0		2	0		0	1		23	12		2	12	
	137		105	0		0	0		0	1		0	2		5	14		6	9		18
	228	221		0	0		0	0		5	5		0	2		25	29		21	23	
	236		204	0		0	0		0	0		0	3		5	11		8	20		17
Protein nonwashable paint	67	60		0	0		100	100		97	76		—	—		100	100		—	—	
	76		44	0		0	100		100	72		81	—		—	100		100	—		—
	130	123		0	0		100	100		81	74		—		—	100	100		—	—	
	137		105	0		0	95		100	36		32	100		—	97		100	—		—
	228	221		0	0		92	100		70	85		100	—		100	100		—	—	
	236		204	0		0	97		97	63		82	100		100	96		100	—		—
Washable flat wall paint	67	60		0	0		15	100		0	81		87	—		77	100		99	—	
	76		44	0		0	9		100	29		71	71		—	78		100	97		—
	130	123		0	0		1	100		34	60		61	—		97	—		93	—	
	137		105	0		0	0		100	21		36	30		—	81		95	86		—
	228	221		0	0		0	100		37	73		63	—		84	98		87	—	
	236		204	0		0	0		75	46		18	23		100	93		91	96		—
Gloss water paint	67	60		0	0		0	0		10	17		27	23		36	32		47	33	
	76		44	0		0	0		0	10		0	5		0	36		29	12		7
	130	123		0	0		0	0		13	4		8	3		56	39		31	9	
	137		105	0		0	0		0	14		2	10		0	45		17	19		6
	228	221		0	0		0	0		16	1		16	2		40	25		33	9	
	236		204	0		0	0		0	6		0	2		0	36		14	16		3
Floor wax	67	60					0	0					0	0					0	2	
	76		44				0		0				0		2				0		2
	130	123					0	0					0	0					0	0	
	137		105				0		0				0		0				1		1
	228	221					0	0					0	0					1	6	
	236		204				0		0				0		0				0		0

[1] Panels coated with freshly-prepared treated paints
[2] Panels coated with treated paints aged one week
[3] Panels coated with treated paints aged one month

EMULSION POLISHES

Application of certain microcrystalline waxes and their formulation in combination with resins, natural waxes and various emulsifiers

By Edwin J. Schnieders, William F. Gross and Charles M. Blair, Jr.

Petrolite Corp., Webster Groves, Mo.

AQUEOUS wax emulsion polishes have become, within recent years, standard items for home and building maintenance. Ease of application, low cost, and low flammability of these emulsions are advantages which have led to their steadily growing use. The so-called "dry-bright" or rubless polish industry originated with the discovery that carnauba wax could be emulsified to give a system, which, when spread on a surface such as linoleum, would dry to a lustrous film. Since that time, many improvements have been made in the properties of such emulsions and of the films deposited from them.

Waxes other than carnauba may be emulsified, and various other vegetable and mineral waxes or combinations of waxes can be utilized to give products of improved quality or some particularly desired property. New emulsifying agents also have been found, and the use of synthetic resins in place of a portion of the wax has been introduced. All of these changes have been directed toward the development of an improved or lower cost commodity.

The art of emulsion manufacture has developed faster than our understanding of the scientific phenomena involved, with the result that many fundamental questions regarding the origin of stability of the emulsion and the relationships between its composition and the properties of the polish film cannot be given logical scientific answers. It is the purpose of this article to outline, in a general way, some of the known and inferable facts about these systems, and to show how certain microcrystalline waxes derived from petroleum may be employed in their preparation.

Rubless polishes are not emulsions in the strict sense of the word, since an emulsion is a system composed of one liquid dispersed in another, and immiscible, liquid. Rubless polishes are dispersions of a solid waxy phase in an aqueous phase, flocculation of the particles being prevented in some manner by soap and electrolytes in the aqueous phase. It is believed that soap molecules are strongly adsorbed on the surfaces of the solid particles and through partial ionization form an electrical double layer which prevents close approach or contact of particles.

Another tenable theory to account for the stability is that the wax is dissolved in soap micelles to form a kind of "sandwich" micelle, the outer surfaces of which consist of the carboxyl groups of the soap molecules, the whole having stability characteristics similar to an ordinary soap micelle.

Electron microscope studies of typical dry-bright emulsions[1] have revealed that the wax particles present are extremely small, varying in diameter within the range of about 0.005 to 0.12 microns. Such particles are not resolvable in an optical microscope.

As a result of this small particle size, these emulsions have a translucent appearance. The particles, having diameters much less than the wave length of visible light, are not efficient reflectors of light. This property is undoubtedly related to the dry-bright character of the films formed from the emulsion. When a typical wax emulsion is spread properly on a surface, such as a floor, and the water allowed to evaporate, the wax particles are deposited as a layer roughly 2 microns thick. Since this layer is composed of particles originally about 0.1 micron or less in diameter, it seems likely that the surface of the wax film will have relatively few irregularities of much more than 0.1 micron in depth. Thus the film reflects light like a mirror, rather than scattering or absorbing light as a rough surface would. When the emulsion contains large particles, the dry-bright quality is lost, since the film then contains large irregularities which scatter light and give the surface an opaque or dull appearance.

Besides being shiny, the wax film must have other properties such as good wearing qualities, low tack, and resistance to water spotting. In addition, the emulsion itself must remain stable even on olng storage and must spread and level properly when applied to a surface.

All of these qualities are interrelated in their demands on nature of wax and emulsifying agent, and for this reason it is difficult to obtain the optimum in all qualities simultaneously. Furthermore, not all manufacturers desire the same properties in their emulsions. Some may want a polish which can be easily removed by mild soap and water. Others may

[1] D. Schoenholz and C. S. Kimball, *Soap and Sanitary Chemicals*, August, 1947.

want a highly water resistant film. The application to which the polish is to be put will often determine the special properties required.

For these reasons, no one particular polish formula can be said to be the best. The manufacturer must consider the application and the market for his product and use his judgment in selecting a suitable formula.

SPECIAL microcrystalline waxes and chemical derivatives of these have found wide utility in the wax emulsion field due to their many unique properties and relatively low cost.

Some of the properties of specially refined microcrystalline waxes which make them particularly useful in emulsion polish formulation are the following:

1.) Low cost.
2.) Ease of emulsification.
3.) Wide range of compatibilities.
4.) "Self-healing" characteristic.
5.) High melting point.
6.) Insolubility in organic solvents and water.
7.) Purity and uniformity.
8.) Low penetration and high gloss.

Four microcrystallines waxes will be discussed here which have been found to be particularly suitable for emulsion manufacture. These are known commercially as Crown 700, Crown 1035, Crown 23, and Crown 36, the properties of which are shown in Table I.[2] The use of these waxes will be described to exemplify the formulations obtainable with this general class of products.

Waxes 700 and 1035 are unsaponifiable mineral waxes, characterized by high melting point, low penetration, good gloss and insolubility in all common solvents. Like all unsaponifiable waxes 700 and 1035 are difficult to emulsify properly when employed alone. Therefore, is is preferable that they be employed in combination with saponifiable waxes such as 23 or 36, or with saponifiable vegetable waxes.

Waxes of different kinds and various synthetic resins are often used together in emulsion polish manufacture, and as a result it is necessary to exercise some care in selecting ingredients which are compatible in the molten state. Otherwise, non-uniform and unsatisfactory dispersions are likely to result. Table II shows the wide range of compatibility of four microcrystalline waxes with a number of typical vegetable waxes and synthetic resins.

[2] Products of Petrolite Corp., Ltd., Kilgore, Tex.

TABLE I

Wax Number	Melting Point ° F	Penetration 100g., 5 sec.	Color N. P. A.	Acid Number	Saponification Number
23	180/185	6 Max.	6 Max.	20 - 25	55 - 65
36	180/185	8 Max.	8 Max.	30 - 35	85 - 95
700	190/195	5 Max.	2½ Max.	Nil	Nil
1035	195/200	2 Max.	2½ Max.	Nil	Nil

Emulsion Polish Composition

AS mentioned above, dry-bright polishes actually consist of suspensions of wax or wax-like solids in an aqueous medium, the whole being stabilized by soaps and electrolytes. In addition, these emusions usually contain a resin solution, such as an ammoniacal solution of shellac, manila resin or the like, which functions to facilitate spreading and leveling of the emulsion, improves smoothness and gloss of the surface film, and reduces slipperiness.

A wide variety of emulsifying agents have been proposed for stabilization of emulsion polishes. In actual practice, however, oleic acid soaps have been found to be most efficient and reliable. Occasionally, mixtures of oleic and stearic acid soaps are employed for this purpose, mixtures containing about three parts or less of oleic acid to one part of stearic acid appearing definitely superior to oleic acid alone in many instances.

In preparing the oleic acid soaps, a number of alkalies, ammonia or amines may be successfully employed. For reasons of cost and utility, the most commonly used bases for preparation of the soaps are triethanolamine and morpholine. Each of these amines has particular advantages, and a number of formulae employing each compound will be given below. As other amines become commercially available at competitive prices, many will undoubtedly find application in the emulsion polish field.

The emulsifying agents employed in polish formulations do not contribute to gloss, hardness and water repellency in the final, dry, polish film, and in fact are detrimental to these properties. For this reason, it is highly desirable that the amount of such emulsifying agent used be kept as low as possible without loss of the dry-bright property or stability.

Commercial dry-bright polishes are usually prepared to contain 12% or more of non-volatile solids, which includes waxes, resins, electrolytes, leveling agent and non-volatile soap constituents. The formulae given below are for polishes containing about

TABLE II

Compatibility of Specially Refined Microcrystalline Waxes with Various Vegetable Waxes and Synthetic Resins

	WAXES 700 - 1035			WAX 23			WAX 36		
Parts of Microcrystalline Wax to Parts of Other Wax or Resin	1:3	1:1	3:1	1:3	1:1	3:1	1:3	1:1	3:1
Carnauba Wax	C	C	C	C	C	C	C	C	C
Candelilla Wax	H	H	H	C	C	C	C	C	C
Ouricuri Wax	C	C	I	C	C	C	C	C	C
Lewisol Resin 21	C	C	H	C	C	C	C	C	C
Durez Resin 51185	C	C	H	C	C	C	C	C	C
Durez Resin 218	C	C	H	C	C	C	C	C	C

C = Clear and homogeneous.
H = Slightly hazy; some incompatibility.
I = Incompatible; separation into phases.

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12% non-volatile constituents. The same formulae may be used to prepare more concentrated polishes by appropriate reduction in the amount of water used. The formulae given are intended merely to be illustrative of the types of polish emulsions obtainable Many variations of any one particular formula are generally possible.

The formulae below are for the preparation of 830 lbs. of emulsion, which is equivalent to about 100 gallons:

Emulsification Procedure

MELT together the waxes, resins, and fatty acids at the lowest temperature possible. Add the amine and stir. Bring temperature to 200-210°F. and add slowly the borax dissolved in about 25 pounds of boiling water. Stir vigorously during addition of the borax solution. A clear gel should be formed at this stage Finally, add hot water (205-210°F.) to the gel. The water should be added slowly at first, while stirring rapidly. As the gel inverts to an emulsion, the water may be added more rapidly. Temperature should be maintained at 200-210°F. throughout water addition. If the rate of water addition is too great at first, it will be noticed that white, opaque streaks will form where the water stream mixes with the gel. Such opaque emulsion should be avoided by reducing the rate of water addition or increasing the stirring rate. The maintenance of the correct temperature at this point is very important.

After about one-half of the water called for in the formula has been added as above described, the heating is discontinued and the emulsion is cooled as rapidly as possible by means of cooling coils, water jacket or otherwise. Stirring is continued slowly during the cooling step. Very vigorous stirring at this point should be avoided as it may lead to some increase in particle size of the dispersion. After the emulsion has cooled nearly to room temperature, the remaining water may be added rapidly at its normal tap temperature.

After the addition of the amine and borax solution to the wax and acid melt, the other steps of the process should be carried out promptly. Unduly long delays or extended periods of stirring may lead to poor results. The mixing kettle should perferably be kept covered throughout the preparation, as evaporation of water from the warm emulsion surface may lead to formation of large particles or lumps of wax.

Wax Emulsions Using Triethanolamine Oleate as Emulsifier

No. 1

Carnauba Wax	60.0 lbs.
Wax Crown 1035	20.0 lbs.
Oleic Acid	6.8 lbs.
Triethanolamine	8.0 lbs.
Borax	5.7 lbs.
Water	730.0 lbs.

No. 2

Wax Crown 1035	32.0 lbs.
Carnauba Wax	25.0 lbs.
Ouricuri Wax	19.0 lbs.
Oleic Acid	10.0 lbs.
Triethanolamine	7.6 lbs.
Borax	5.7 lbs.
Water	730.0 lbs.

No. 3

Wax Crown 36	29.0 lbs.
Carnauba Wax	26.0 lbs.
Wax Crown 1035	23.0 lbs.
Oleic Acid	6.5 lbs.
Triethanolamine	9.7 lbs.
Borax	5.7 lbs.
Water	730.0 lbs.

No. 4

Wax Crown 36	56.0 lbs.
Wax Crown 1035	11.0 lbs.
Carnauba Wax	9.6 lbs.
Oleic Acid	7.6 lbs.
Triethanolamine	10.2 lbs.
Borax	5.7 lbs.
Water	730.0 lbs.

No. 5

Wax Crown 23	57 to 19 lbs.
Carnauba Wax	19 to 57 lbs.
Oleic Acid	8.9 lbs.
Triethanolamine	9.6 lbs.
Borax	5.1 lbs.
Water	730.0 lbs.

No. 6

Wax Crown 36	34.0 lbs.
Wax Crown 1035	17.0 lbs.
Durez Resin 219[4]	22.0 lbs.
Oleic Acid	13.0 lbs.
Triethanolamine	11.0 lbs.
Borax	3.8 lbs.
Water	730.0 lbs.

No. 7

Wax Crown 23	64.0 lbs.
Carnauba Wax	5.8 lbs.
Chlorowax CP-70[3]	7.7 lbs.
Oleic Acid	7.7 lbs.
Triethanolamine	9.7 lbs.
Borax	5.2 lbs.
Water	730.0 lbs.

No. 8

Wax Crown 23	61.0 lbs.
Lewisol Resin 21[5]	20.0 lbs.
Oleic Acid	4.7 lbs.
Triethanolamine	8.9 lbs.
Borax	5.4 lbs.
Water	730.0 lbs.

Wax Emulsions Using Morpholine Oleate as Emulsifier

No. 9

Carnauba Wax	61.0 lbs.
Wax Crown 23	20.0 lbs.
Oleic Acid	9.5 lbs.
Morpholine	8.8 lbs.
Borax	0.7 lbs.
Water	730.0 lbs.

No. 10

Wax Crown 23	61.0 lbs.
Carnauba Wax	20.0 lbs.
Oleic Acid	8.8 lbs.
Morpholine	8.8 lbs.
Borax	0.7 lbs.
Water	730.0 lbs.

No. 11

Wax Crown 23	66.0 lbs.
Chlorowax CP-70	17.0 lbs.
Oleic Acid	8.3 lbs.
Morpholine	9.0 lbs.
Water	730.0 lbs.

No. 12

Wax Crown 36	30.0 lbs.
Carnauba Wax	27.0 lbs.
Wax Crown 1035	25.0 lbs.
Oleic Acid	7.0 lbs.
Morpholine	9.0 lbs.
Borax	2.0 lbs.
Water	730.0 lbs.

[3] Product of Hooker Electrochem. Co., Niagara Falls, N. Y.

[4] Product of Durez Plastics, Inc., N. Tonawanda, N. Y.

[5] Product of Hercules Powder Co., Wilmington, Del.

Additives for Emulsions

LEVELING and spreading properties may usually be improved by incorporating from 10% to 20% of shellac, casein, Manila resin solution or mixtures of such solutions in the emulsion. Representative leveling solutions are as follows:

12% Shellac Solution

Refined, dewaxed shellac	102 lbs.
Ammonia, 26° Be', 28%	26 lbs.
Water	722 lbs.

This solution is best prepared by heating the required water to 175°F., then adding the ammonia with stirring and

(*Turn to Page* 163)

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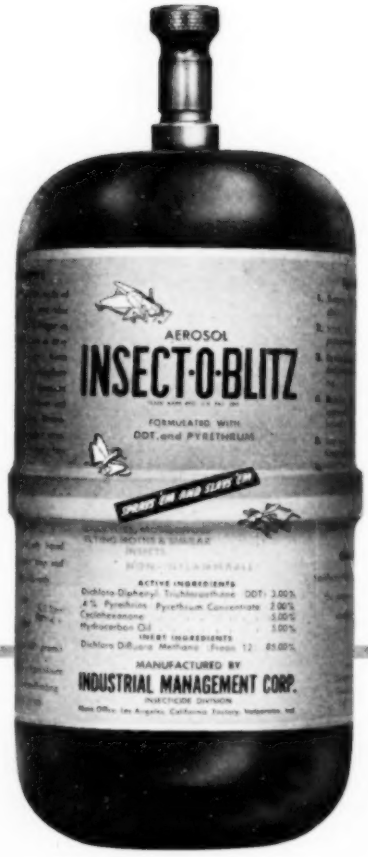

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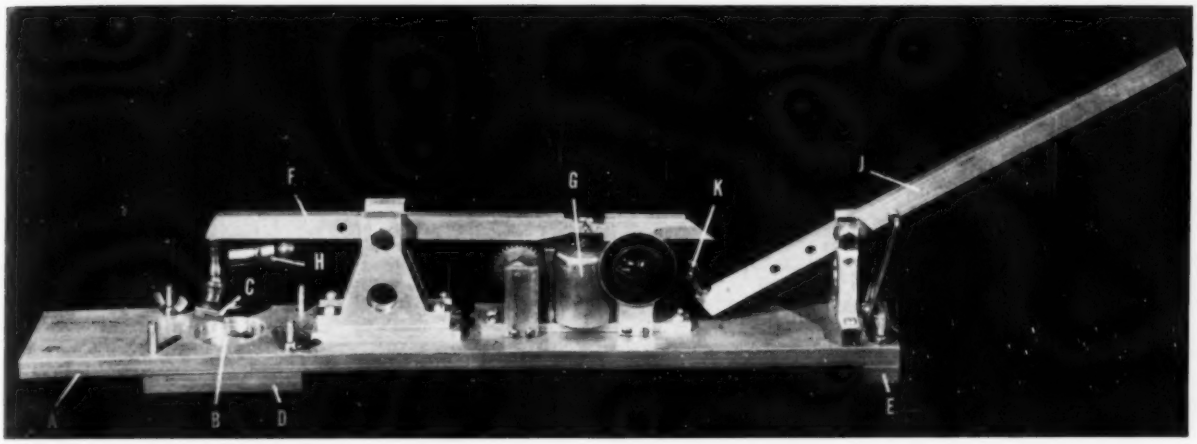

Above: Instrument described in article for measuring tack.

Tack of Wax Films

By Harry R. Broll, Melvin Fuld and Adrien S. Dubois
Fuld Bros. Co., Baltimore

Second of a series of reports on end-use laboratory evaluation of sanitary chemical specialties [1]

THE evaluation of tack and of the closely related drying time of various types of films has been the subject of numerous studies, leading to the development of several useful devices (1). These instruments have found extensive use, principally in the paint and lacquer industries. In the field of floor waxes, the method proposed in the tentative commercial specification (2) is of a strictly qualitative nature. A little over a year ago, M. Fuld (3) described a modification of the "Touch Controller" (1c) adapted for use with wax films. While this instrument proved very satisfactory in the laboratory, it could not be used for "on-the-spot" evaluation of tack. Further studies have led to the development of an instrument suitable for quantitative measurements in the laboratory as well as in the field.

Definition of Tack

Tack is defined in Webster's dictionary as the "Quality of sticking or adhering; adhesiveness; stickiness as of paint, printing ink, etc.; nearly dry." Although this definition is representative, a more adequate and scientific one is provided by Bikerman (4). He states that tackiness is the effort required to separate two solids when the clearance between them is filled with a liquid adhesive, an effort which is greater than when either absorbed oxygen or water is between the solids. Tackiness was described by Stefan (4) as a purely rheological phenomenon, and he developed an equation defining the force required to separate two plates in terms of time, viscosity of the adhesive, area of the plates and distance between the plates. From Stefan's equation it is possible to conclude that there is no definite minimum force below which the plates cannot be separated. If the period of time is long enough, even a small force will achieve separation. This is probably the main characteristic of tack.

The above considerations indicate that the tack of any film is a function of the pressure exerted upon the film. Hence, it is conceivable that any film will exhibit tack if a large enough pressure is applied for a sufficient length of time. A good example of this is the fact that when a heavy piece of furniture is placed on a thoroughly dried, varnished floor, it will stick to the floor within a few months. Hence, in evaluating tack, it is necessary to select definite conditions of test, which although arbitrary, must be kept standard.

Description of Apparatus

The instrument [2] consists of four essential components: base plate, lever and electromagnet. The base plate (A) is a long, narrow plate (3 x 22¼") to which the other component parts are fixed. A hole (B), 1¾" in diameter, cut through the base plate allows the "shoe" (C) to be applied to the surface under test. For laboratory use, a 4 x 3" plate

[1] Supplementing a paper before the Natl. Assn. of Insecticide & Disinfectant Mfrs., Baltimore, Dec. 1947.

[2] The device can be considered as a modification of the "Gardner Magnetic Tack Tester" (1a), which was brought to our attention after the one described here had been developed.

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(D) is attached to the base under the hole and another one (E), 3 x ¾", at the other end to keep it level. The surface under test is inserted between the two plates and clamped securely. For field use, D and E are removed and the apparatus placed directly on the floor.

The balance consists of a beam (F), ¾ x 12⅞", fitted at one end, 4¼" from the fulcrum, by means of a swivel joint with a leather-lined "shoe," having an area of ½ sq. in. At the other end of the beam, 5¼" from the fulcrum, is attached a plunger fitting into the electromagnet (G). A counterweight (H) is provided to insure proper balance. The fulcrum is 2¾" from the base.

The lever (J) consists of a bar, ¾ x 13¾", resting on a fulcrum. At one end, 4¼" from the fulcrum, a small wheel (K), is attached to minimize friction. At the other end, a weight is applied. An auxiliary small attachment keeps the lever in an upward position when pressure is not being applied to the test surface.

The electromagnet is fitted on a rack and pinion so that it may be moved to alter the force. The electromagnet is operated at a voltage of 12 volts from the 110-volt AC line, through a transformer connected to the magnet through the variable rheostat, having calibrated dial.

Operation Procedure

To carry out a determination, the instrument is placed on the floor, or a sample inserted between A and D. A weight is fixed at the end of the lever J and the lever is brought into contact with the balance arm. The pressure is exerted for a given period of time, and it is then released by securing the lever in an upward position. The electromagnet is then carefully operated until the "shoe," becomes freed. The force, in grams required to lift the "shoe," is then obtained directly by reading the various dials, which are calibrated against a curve.

The instrument is easily calibrated. The pressure exerted by the "shoe" upon the test surface is calculated from the constants for the instrument and the weights applied. It can be checked by means of a suitable, sensitive balance arrangement. The force necessary to separate the "shoe" from the test surface is determined either (a) by placing known weights on the "shoe," or (b) by actually measuring the force by means of a sensitive dynamometer, and calibrating the magnet with reference to these.

In the course of these studies several materials were tried for the "shoe," e. g. rubber, metals such as copper and brass, and leather. The latter was finally selected as being most closely representative of actual conditions.

Other methods of exerting a force such as the direct application of weights, a chainomatic attachment, etc., can be used. It is felt that the electrical system is best, since it is the fastest. This is important because the application of the force should be as instantaneous as possible for it is known from above that a smaller force applied for a longer time will separate the surfaces. This is a very important source of error.

Regarding the pressure to be applied to the wax film, the practical case of an average person walking on a floor was considered and it was calculated that in normal walking, a pressure of about 5 to 10 lbs. per sq. in. is exerted on the wax film. However, for study purposes, it was found necessary to increase this. The period of time during which this pressure is applied is entirely arbitrary, and exaggerated, since the period of contact observed in practice is too short to be of value for evaluation purposes.

Tack Index

The standard of reference adopted in this work, the "tack index for a given period of test," is the force in grams weight which must be exerted to separate the "shoe" from the surface under test, after the "shoe" has been pressed upon the surface with a pressure of 5 kg. per 6. 45 sq. in. (22 lbs. per sq. in.) for that given period of time.

The existence of a correlation between the tack index per given period of time and that period of time would be expected from Stefan's equation. It has been found, for instance, on the same sample of wax and under the same conditions of tests, that the "tack index" varied from 3 for a 2-minute application of pressure, to 10 for a 60-minute period.

A comparison of various experimental self-polishing waxes has shown that, dependent upon the formulation, a "tack index" of 0 to 50 was obtained. The one factor which this limited investigation has strongly emphasized is the influence of temperature and humidity on tack. The results obtained amply corroborate the widely held belief that little tack is observed under conditions of low temperature and humidity, such as prevail in winter time. For example, the same wax under the same conditions of test gave a "tack index" of 0 at a temperature of 78°F., and relative humidity of 50% and of 10 at a temperature of 78°F., and humidity of 70%.

The few observations made up to now indicate that the following factors must be standardized in any test for tack by this procedure:

1. Drying time of wax film
2. Temperature and humidity of atmosphere
3. Period of application of pressure
4. Pressure applied to the "shoe"

No attempt is made here to answer the question of what actual values for force determine whether a film is tacky in practice. This should be established on the basis of extensive studies on floors, taking into consideration the opinion of a large number of informed users as to whether the surfaces tested are tacky or not.

The method and instrument described here are still in an experimental stage. However, it is felt that even at this stage, the instrument can serve as a starting point for further studies on the standardization of tack in this industry.

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Space Spray Toxicity . . .

By W. A. Gersdorff and M. S. Schechter

Bureau of Entomology and Plant Quarantine (USDA).

Toxicity to house flies of space sprays containing certain diaryl ethers and pyrethrum extract

PRELIMINARY tests have shown that a number of substituted diaryl ethers are toxic to house flies (*Musca Domestica* L.). Several patents have been issued on the use of such compounds as insecticides.[1] The toxicity of the compounds is not great enough to warrant their use as the sole toxicants in fly sprays; however, the tests have furnished evidence of synergistic activity when they are mixed with pyrethrum extract. Although such mixtures are not so effective against flies as DDT, with its high toxicity and long residual effect, efficient fly sprays may be made from them with considerable saving of pyrethrum. The ethers are easily prepared, and many of them are now commercially obtainable. On account of the shortage of pyrethrum during the war and before the development of DDT, a study was made of a number of these compounds. The results of this study are being reported here.

The compounds tested are listed in table 1. All were commercial samples, except bis(p-bromopheny!) ether, which was prepared by brominating phenyl ether in chloroform with iron as a catalyst.

In preliminary tests to indicate synergism and to furnish information on the concentrations to be required, these compounds were dissolved in refined kerosene and, at selected concentrations, used alone in sprays or incorporated in sprays containing 0.5 mg. of "pyrethrins" per milliliter. The usual kerosene extract of pyrethrum flowers was used, pyrethrin I and cinerin I comprising 55 per cent of the total pyrethrins.

The tests were made by the turntable method on house flies. Mortality percentages, based on 1-day counts, were determined on two or six replicates, as stated, with approximately 150 flies to each test. For standards of comparison, solutions of pyrethrins in refined kerosene were tested at concentrations of 0.5, 1, and 2 mg. per milliliter. The results are given in table 1.

For the study of comparative effectiveness of the ethers in replacing part of the pyrethrins, the concentrations of the ethers were so planned from the information obtained from the preliminary tests that results at three mortality levels in a range straddling 50 per cent would be obtained for each compound. These tests were also made by the turntable method, and six replications were made on each spray on separate days. The results are given in table 2.

The mean concentration causing 50 per cent mortality is the average of the estimations from the six replications. These estimations were made from the concentrations-mortality lines fitted by the method of least squares on log probability paper. The standard errors were obtained from an analysis of variance of the logarithms of these daily estimations, the standard errors of concentrations being determined from those of the logarithms.

[1]Concentrations include the 0.5 mg. mentioned in the table heading.

The brominated derivatives

TABLE 1. — Toxicity to adult house flies of kerosene sprays containing certain diaryl ethers and their mixtures with pyrethrum extract. Means of two tests at the 100 mg. per ml., six at the other concentrations, approximately 150 flies being used in each test.

Material	Concentration	MORTALITY IN 1 DAY	
		Material alone	Mixture with 0.5 mg. of pyrethrins per milliliter
	Milligrams per milliliter	*Per cent*	*Per cent*
Phenyl ether	50	5	31
x-Chlorodiphenyl ether	50	15	65
x-Dichlorodiphenyl ether	50	33	92
x-Trichlorodiphenyl ether	50	32	89
p-Bromophenyl phenyl ether	100	97	97
	50	27	67
Bis (p-bromophenyl) ether	100	98	99
	50	35	92
x-Chloro-(phenyl xenyl ether)	100	15	93
	50	11	52
x-Dichloro-(phenyl xenyl ether)	100	25	87
	50	9	54
Pyrethrins (standard)	2	73	—
	1	45	—
	0.5	21	—

[1] U. S. Patents: 2,134,556, Oct. 25, 1938, to William F. Hester; 2,347,393, April 25, 1944, and 2,365,047, Dec. 12, 1944, to Euclid W. Bousquet and Hubert G. Guy. Swiss Patents: 199,985, Dec. 1, 1938, and 203,306, June 1, 1939, to J. R. Geigy, A. G.

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TESTED AND PROVED EQUIPMENT

TABLE 2. — Toxicity to house flies of kerosene sprays containing certain substituted diaryl ethers mixed with 0.5mg. of pyrethrins per milliliter.

Compound	Concentration	Mean mortality	Mean concentration causing 50 per cent mortality
	Milligrams per milliliter	*Per cent*	*Milligrams per milliliter*
x-Chlorodiphenyl ether	15	35	31.1 ± 2.9
	30	49	
	60	79	
x-Dichlorodiphenyl ether	10	43	12.7 ± 1.3
	20	70	
	40	89	
x-Trichlorodiphenyl ether	10	46	14.4 ± 1.4
	20	55	
	40	85	
p-Bromophenyl phenyl ether	10	29	23.8 ± 2.4
	20	41	
	40	66	
Bis (p-bromophenyl) ether	10	46	12.1 ± 1.2
	20	67	
	40	87	
x-Chloro-(phenyl xenyl ether)	20	32	43.6 ± 4.1
	40	51	
	80	72	
x-Dichloro-(phenyl xenyl ether)	20	38	38.8 ± 3.9
	40	48	
	80	72	
Pyrethrins [1]	0.5	20	1.21 ± 0.12
	1	42	
	2	71	

[1] Concentrations include the 0.5 mg. mentioned in the table heading.

The brominated derivatives were very effective alone at a concentration of 100 mg. per milliliter. Mixtures of each halogenated compound with pyrethrins gave evidence of synergistic action, as may be seen in table 1.

Bis(p-bromophenyl) ether, x-dichlorodiphenyl ether, and x-trichlorodiphenyl ether were significantly better for replacing part of the pyrethrins than were any of the other compounds, but no significant difference among them was demonstrated. When mixed with 0.5 mg. of pyrethrins per milliliter and compared at the 50 per cent mortality level, 13 mg. of each per milliliter had an effect about equivalent to that of 0.7 mg. of pyrethrins per milliliter. At 40 mg. per milliliter each ether, when mixed with the pyrethrins, formed a spray which caused a higher mortality of house flies than did a spray containing 2 mg. of pyrethrins alone per milliliter; that is, each mixed spray was better than an AA fly spray.

The knock-down in 25 minutes was complete in all tests with the mixed sprays.

TOXICITY OF DDT

(*From Page* 133)

water for washing cotton goods (with and without ironing), and water for sponging chintz (with ironing); (2) the use of mechanical means such as brushing and the use of a vacuum cleaner on mohair, and the removal of house dust on shellacked wood and wallpaper by means of a cloth; and (3) the use of chemical surfacing agents such as paste cleaner on wallpaper, and wax on shellacked wood and linoleum.

Experimental Technique: Fabrics were sprayed on an open framework and fastened to panels for testing as previously described, shellacked wood was allowed to dry 45 days before spray application, and wallpaper was mounted on sized-plaster blocks. As controls, duplicate sets of panels were sprayed but did not receive any cleaning.

Tests on the residual effectiveness of the surfaces were made at two week intervals with one cleaning operation between each test, and continued until the 24-hour mortalities of the *A. quadrimaculatus* female mosquitoes, exposed to the surfaces for 60-minute periods, were approximately 30 percent or less.

Results: From the results of the various liquid cleansing agents (table 4), it was evident that the mineral spirits in dry-cleaning acted as a DDT solvent, and readily removed the DDT deposits from all fabrics. Washing and sponging with soap and water did not markedly reduce the residual effectiveness of DDT as shown by the tests on cotton goods subjected to washing only. The use of a hot iron on the cotton goods, however, rapidly reduced the effectiveness of DDT deposits. To a lesser degree the use of a low-heat iron on the glazed chintz did the same.

The initial vacuuming of mohair probably removed all DDT not firmly adhering to the fabric and subsequent treatments had little effect in reducing residual toxicity (table 4). Vigorous brushing, however, apparently removed more DDT each time that it was done.

In a comparison of the three cleaning operations applied to mohair, dry-cleaning had the most, brushing somewhat less, and the use of a vacuum cleaner the least delteterious effects upon DDT residual effectiveness (figure 2).

Dusting caused a gradual decrease in the residual toxicity of DDT on shellacked wood and wallpaper. Paste wallpaper cleaner rapidly removed the DDT deposit from wallpaper (table 4).

From a comparison of the effect of cleaning wallpaper with a paste cleaner or dusting (figure 3), it can be seen that although all three sets of panels had a very high residual effectiveness initially, both types of surface manipulations caused a rapid decrease, with the paste cleaner being more deleterious than the dusting.

Waxing prior to spray application greatly decreased the residual effectiveness of the DDT deposits on shellacked wood, but increased slightly the toxicity of DDT on the linoleum (table 4). In the case of the wood, the emulsion apparently readily penetrated the wax and more DDT was lost below

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the surface than in the case of plain wood. On the other hand, in the case of the linoleum, the waxed surface was more impervious to the emulsion than plain linoleum which has been shown to be readily penetrated by DDT-xylene emulsion in previous work (1). In both instances, rewaxing caused a decrease in toxicity as the DDT deposits were probably further covered by the wax layer.

Summary

By means of laboratory tests with adult female *A. quadrimaculatus* mosquitoes, certain relationships between the residual toxicity of various DDT spray applications and different types of surfaces and surface treatments have been ascertained.

On a series of different surface materials, deposits of 200 mg. DDT per square foot from a 5-percent-DDT xylene emulsion, gave satisfactory laboratory results for six months on dry bamboo, bark, rusty metal screen, pine plywood and rusty sheet metal. Under similar test conditions DDT deposits gave satisfactory laboratory

(*Turn to Page* 189)

CLEANER IDENTIFICATION

(*From Page* 45)

tural formula, very interesting observations can be made. If, for example, 7.8 mls. of one percent potassium oleate produces permanent lather and if 3.9 mls. of it have been added to the hard water to be used for a titration. it will be found that with certain synthetic detergents, only one ml., and with others more than 20 mls., of a one percent solution are necessary to re-solubilize the metallic soaps and form a permanent lather. With this method, not only one percent alcohol-extracted soap solutions, but compounded detergent mixtures diluted to a one percent solution also can be evaluated.

There are synthetic detergents on the market which replace four times the amount of potassium soap and are comparitively cheaper. There are others which have no compatibility whatsoever with alkali soaps, metallic soaps, mineral oil and vegetable oils and can be regarded only as wetting agents. This simple airotitrator method serves to differentiate between these products quickly and adequately.

WHALE OIL

(*From Page* 49)

Fatty whale oil was for centuries used as a fuel. Improved processes for refining and hydrogenating, developed several decades ago, created new markets to replace the old. Hydrogenation eliminated odor and taste and resulted in a harder oil of value to soap, margarine and shortening. The sulfonated product also has had a rapid growth since 1942. During the war, the insufficient supply precluded consumption in soap in order to satisfy other and more urgent industrial demands so far as possible.

The industrial importance of whale oil has fluctuated widely over the years. Its future in soap making depends upon the world supply of whale and other fats and oils, the level of industrial competition for the supply, and the new developments in formulation. The war-induced expansions of tall oils, rosin, detergents and builders have created new habits in soap making. In some part, these will be permanent and so affect the extent of the market that can be recaptured by whale oil.

Until the fifteenth century, the Bay of Biscay was the center of whaling operations. The Dutch and English led in the exploration of the North Atlantic where the mammals were plentiful. American participation began early in the eighteenth century and these ships extended the range southward to Antarctic. Providence, Nantucket, Bristol and New Bedford became centers of the industry and exports went largely to U.K. About a century ago, the American fleet numbered over 700 ships that sailed from the Pacific Arctic to the Antarctic.

The discovery of petroleum in 1859 led to the rapid disuse of whale oil as a fuel. The demand for whalebone for corsets, umbrellas, canes and brushes grew and whaling contined to prosper. When the British and Norwegians developed the steam whaler, the American industry was rapidly liquidated. Less than 50 ships survived the turn of the century.

By the early 20's the Antarctic was the dominant source and in the next decade contributed over 90 percent to the world supply of whale oil. The Japanese joined the British and Norwegian fleets in the Antarctic in 1935. The Germans followed the next year. During the season 1937-38, the total of sperm and whale oils produced was 1.4 billion pounds of which the Norwegians accounted for 36 percent, Japan 12 percent and Germany 11 percent.

The exhaustible nature of the supply not only has moved the hunting grounds to the remoter ends of the earth but, in addition, has led to international co-operation to conserve the remaining resources. This began about 15 years ago when Great Britain and Norway, together with the League of Nations established an international agreement for the regulation of whaling. The war ended the agreement. In February, 1944, seven nations subscribed to a new regulatory protocol. This included for the first time a limitation of the kill. The "blue whale unit" was established and the limit placed at 16,000, equivalent to about 600 million pounds of whale and sperm oils—about half the pre-war kill. Other conservation measures also were provided.

The world fleet of sailing ships numbered about 1,000 just 100 years ago. The catch was limited to the slower sperm and right whales. The evolution of the steam whaler produced the factory ship. By the late 30's, 35 of these were in operation. Many were sunk, destroyed and converted during the war.

The 1945-46 season saw nine again in service with an increase to 15 the following year. The current expedition consists of 17 factory ships with 154 "catchers" in attendance. The catchers can overtake any mammal afloat. The factory ship is an efficient rendering plant for the production of a superior crude oil. While the glamor has gone out of whaling, whale oil has left soap only temporarily.

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Simple Insect Test Cage

By L. R. Gillogly

Bureau of Chemistry
Calif. Dept. of Agriculture

Upper photo shows simple test cage for insects. Lower view is of materials and method of assembling simple, easily cleaned cages.

A SIMPLE, easily cleaned, inexpensive cage is necessary in the laboratory for use in testing the contact toxicity of spray materials in such a manner as to minimize the toxic effect of deposits on surfaces. The cage described in this paper was designed for use with the Hoskins' Mist Chamber to determine the direct contact toxicity of various materials to houseflies. (The mist chamber is discussed in *Soap and Sanitary Chemicals*, April, 1947, p. 143 et seq., "Development and Use of a Small Spray Chamber.") The cage can be used in other types of apparatus and might easily be adapted for testing the effectiveness of residual deposits.

Many of the new organic chemicals leave a toxic residue which is difficult to remove. The removal of these materials has made the use of the Peet-Grady chamber so laborious that its use has been discontinued in many laboratories. The test cage developed in our laboratory is essentially a cylinder of paper screened on each end. The paper serves as the body of the cage as well as the lining and it is discarded after use. Although we use a cage 3½ inches in diameter and 2 inches high, similar cages can be constructed with any desired diameter or length.

The cage consists of a strip of deadening felt 2 inches wide and 12 inches long ("A") and two cylindrical friction lids ("C") fitted with screen. As illustrated in the photograph, the deadening felt is bent to form a cylinder and is fastened with a single wire staple ("B"). The cylinder is made just large enough to fit snugly into the friction rings. All the usual clips, snaps, hooks, or latches are thus eliminated.

The flies are reared in standard Peet-Grady cages and when desired for testing, all dead flies are removed and the entire cage of flies is etherized by placing it in a box and passing air into the box through a gas-washing bottle containing ether. The flies are then poured onto a tray where they are quickly divided with a spatula into the desired number of approximately equal piles which are scraped into the test cages. With reasonable care and timing, the flies all recover quickly and are soon ready for testing. If the procedure is carried out rapidly, no flies are lost. As all flies are used, the sample in each cage is more nearly random than if the flies are blown or allowed to fly from the rearing cage into the test cage.

Immediately after exposure to the spray, the small test cage is placed

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in a Peet-Grady type cage and opened. The parts are then removed through the cloth sleeve. In this way all flies are transferred without loss of the more active individuals and the effect on the flies of the spray deposit on the cage is kept to a minimum. With this method it is not necessary to secure knockdown as even an unsprayed check is easily handled.

The rings and screens should be washed with acetone or other appropriate solvent before being used again.

EMULSION POLISHES

(*From Page* 149)

then the shellac. The mixture is stirred and heated to 200°F. until the shellac is dissolved. The shellac solution is then cooled and stored for use. Fresh shellac should be used, as the old product may be wholly or partly insoluble in the ammonia solution.

12% Casein Solution

Casein B1	100 lbs.
Dowicide #1	8 lbs.
Sodium Hydroxide flake	4 lbs.
Water	738 lbs.

The casein is soaked in 85 gallons (706 pounds) of cold water. The sodium hydroxide is dissolved in 32 pounds of water and the Dowicide #1 added and stirred until dissolved. The casein-water mixture is heated to 150°F. with stirring and the Dowicide solution is added. These are stirred while kept at 150°F. until complete solution results. It is then cooled and stored for use. The Dowicide is used as a preservative to prevent decomposition of the casein protein.

12% Manila Resin Solution

Manila Resin	82 lbs.
Ammonia, 26° Be (28%)	28 lbs.
Water	740 lbs.

The ammonia is added to the powdered Manila resin, followed by about one-third of the water heated to a temperature of 140-160°F. This mixture is allowed to stand overnight. Another third of the water, heated to 140-160°F. is then added, and the whole stirred until a clear, homogenous solution is obtained. The remainder of the water is then added. If the solution is not clear prior to the final water addition, more ammonia should be added, in small amounts, and stirred in until the solution is clear. Filter through cheesecloth to remove any suspended solid or undissolved resin.

RESIDUAL TOXICITY

(*From Page* 143)

and III were more effective than Series I with washable flat wall paint; (5) All series displayed the same knockdown rate in the case of protein nonwashable water paint; (6) Minor fluctuations occurred in rate of knockdown in each series on successive testing dates due to the varying rates of Toxaphene and DDT crystallization in the different paints; however, the effect of film aging, for all paints with both toxicants, did not cause a significant reduction in residual toxicity during the eight-month period of observations; (7) Floorwax, containing 5% DDT, did not effect any knockdown within 48 hours; (8) Control panels, coated with the several paints, excluding toxicants, produced no mortality up to 48 hours.

Summary.—Various surfaces, including pebbled glass, unpainted wood, Celotex, Texolite water paint, whitewash plus toxicant, and whitewash on which the toxicant was sprayed after drying, treated with comparable 10 per cent (by weight) water emulsions of Toxaphene and DDT to give a theoretical deposit of 100 mg. of toxicant per sq. ft., were compared for residual effectiveness against the house fly over a period of 225 days. DDT proved superior to Toxaphene in speed of knockdown and in six-hour mortality for all surfaces tested. Mortality rates for the various surfaces, with both toxicants, were in the following descending order: Toxaphene (Celotex, both whitewashed surfaces, pebbled glass, Texolite water paint, and unpainted wood); DDT (both whitewashed surfaces, Celotex, Texolite water paint, pebbled glass, and upainted wood). No significant difference was established in knockdown or mortality rates for the two whitewashed surfaces in which the toxicants were either incorporated in the whitewash or sprayed upon the whitewashed surface.

Three series of pine panels, coated with treated paints of varying ages and containing 5 per cent Toxaphene or DDT were observed for residual toxicity against the house fly over a period of eight months. With respect to residual toxicity, freshly-mixed paint plus toxicant, paint plus toxicant aged one week, and paint plus toxicant aged one month exhibited the following trends:

(1) Toxaphene produced a greater knockdown than DDT with an oleoresinous enamel, oleoresinous flat wall paint, and gloss water paint; (2) DDT produced a greater knockdown with protein nonwashable water paint and washable flat wall paint; (3) Protein nonwashable water paint and washable flat wall paint, with both toxicants, were more effective in initiation and completion of knockdown than all other paints; (4) Toxicants in freshly-mixed paint were more effective than those in aged paints with oleoresinous enamel, oleoresinous flat wall paint, and gloss water paint; (5) Toxicants in aged paints were superior in washable flat wall paint; (6) Knockdown with protein nonwashable water paint was equal in all series; (7) Floor wax containing 5% DDT did not effect any knockdown within 48 hours; and (8) Aging of the film did not cause a significant reduction in knockdown throughout the entire observation period of 225 days.

Hexachloride Absorption

After oil solutions of benzene hexachloride have been sprayed on the skin of cattle, the blood contains the compound for several days. Adsorption is one cause for loss of insecticide applied to the skin. F. Barlow, *Nature* 160, 719-20.

Insecticide From Plant

Physalis mollis, commonly known as smooth ground cherry, is a plant indigenous to Oklahoma. The leaves have been used as a fly poison by residents of that state. A biological study of the constituents of the leaves indicates that a glucoside contains the toxic fraction. L. E. Harris, *J. Am. Pharm Assoc.*, Sci. Ed. 37, 145-6 (1948).

TECHNICAL Briefs

From Current Literature in the Sanitary Products Field

New Insecticides

Bis(dibutyl amino) alkanes, in which the alkylene groups, both ends of which are singly bonded to a separate nitrogen atom, containing 3-4 carbon atoms, are mixed with kerosene or similar distillate, to form contact insecticides for flies, mosquitoes, and common agricultural pests. An example is 1,4bis(dibutylamino) butane. G. H. Morey, to Commercial Solvents Corp. U. S. Patent No. 2,433-525.

Insecticide Combinations

Partial esters of aliphatic polyhydric compounds such as ethylene glycol, glycerol, mannitol etc., are combined with parasiticides of vegetable origin such as pyrethrins or rotenone, to form water-dispersible concentrates useful for controlling insects and mites. K. R. Brown, to Atlas Powder Co. U.S. Patent No. 2,432,-607.

Germicidal Power Changes

The germicidal power of the phenols is diminished by ethylene glycol and glycerol, that of thymol and the chlorophenols being affected to a greater extent than either phenol or para-cresol. The germicidal power of acetone and tert.butyl alcohol, on the other hand, is increased two-fold in the presence of glycol or glycerol. Diethyl acetal is a more active germicide than dimethyl acetal. The practical conclusion is reached that glycol and glycerol, while causing a diminution in the bactericidal action of phenols actually enhance the germicidal power of certain aliphatic compounds. The bearing of the results on the theory of disinfection is discussed. E. A. Cooper, *J. Soc. Chem. Ind.* 67, 69-70 (1948).

Pyrethrin Substitutes

Rapid knockdown, an essential requirement of commercial fly sprays, is usually conferred by the addition of pyrethrins. A number of thiocyanoacetates were prepared in searching for pyrethrin substitutes. These compounds in general are free from the unpleasant odor characteristics of the alkyl thiocyantes, have rapid knockdown and are highly toxic to houseflies. The most active compounds prepared were too irritant to human mucous membranes for use in practical fly sprays. However, compounds obtained from a saturated aliphatic or cyclic alcohol containing 10 carbon atoms were sufficiently active and nonirritant. Among the compounds tested which were nonirritant and had high knockdown value were "Thanite," fenchyl thiocyanocetate, and carvomenthyl thiocyanoacetate. Theories are advanced to relate knockdown activity and chemical constitution. J. F. Grove and H. H. S. Bovington, *Ann. Applied Biol.* 34, 113-26.

Delousing Agent

Hexachloroethane is an effective delousing material when used as a powder impregnant or in oil solutions, as shown by experiments with calves, pigs, and sheep. Vegetable solutions have better penetrability and may be preferable. Generally, a 20 per cent solution was also effective in the therapy of eczemas produced by parasitic insects, as well as in the therapy of sheep infested by insects causing shedding of the hair. G. B. Tsaturyan, *Veterinariya* 24, No. 4, 37-8; through *Chem Abs.*

Control of Sandflies

Treatment of wire screens used to exclude mosquitoes, with 5 per cent of DDT in kerosene, will protect against the bites of sandflies. Spraying the possible sandfly resting places did not provide outdoor protection. H. Trapido, *J. Econ. Entomol.* 40, 472-5 (1947).

Evaluation of Germicides

A review of the principles on which the evaluation of bactericidal activity should be based has been presented. Phenol coefficients are satisfactory for those disinfectants in which it can be shown that the mode of action of the active principle is similar to that of phenol. For anti-bacterial substances bearing no resemblance to phenol in structure, a phenol coefficient has a very narrow meaning; in such instances it is necessary to find, if possible, a standard reference substance against which to compare activities, in order to comply with the principle underlying biological assays, of which the assessment of antibacterial activity is an example.

Counting techniques afford more scope for investigation into the dynamics of disinfection process than do end-point methods. Although *in vitro* tests are of immense value in the preliminary stages in the development of a disinfectant substance, knowledge of its action towards living tissues should also be available. Tissue culture techniques and an investigation into anti-leucoytic activity offer useful approaches to the *in vivo* methods.

The ultimate uses to which the substance will be put should always be borne in mind, so that representatives of the classes of organisms with which the disinfectant is likely to meet in actual practice are used in the laboratory tests. Much progress has been made in devising rational tests

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TELEPHONE PLAINFIELD 4-7770 OR WRITE, WIRE:

RHODES CHEMICAL CORP. 417 Cleveland Ave. ° **FAIRFIELD LABORATORIES, INC. Plainfield, N. J.**

to evaluate germicidal activity for clinical purposes. I. Michaels, *Manufacturing Chemist* 19, 5, 60, 109 (1948).

Gamma Isomer in BHC

The gamma isomer of benzene hexachloride has recently become the object of interest because of its outstanding effectiveness as an insecticide. Technical benzene hexachloride usually contains 10-12 per cent of this isomer, along with varying proportions of at least four other less active isomers, and small amounts of other compounds. A boiling-point method has been developed for determination of the gamma isomer in mixtures of the isomers or in the technical product. C. V. Bowen and M. A. Pogorelskin, *Anal. Chem.* 20, 346-8 (1948).

Treating Foot Infections

In contrasting old and new methods of treating fungous infections of the feet such as athlete's foot, it is pointed out that salicylic-acid ointments which inflame an already injured skin and are not fungicidal, also coal-tar dyes, have fallen into disfavor. These older agents have been replaced by the salts of propionic, undecylenic, oleic, and caprylic acids, the chlorophenols, orthophenyl phenols, and salicylanilide. By using wet dressings and these fungicides, infections are easily cleared up, but reinfection often occurs unless the patient is instructed in prophylatic measures. These consist of thoroughly drying the toes after bathing, and applying a powder containing a nonirritant fungicide. L. Schwartz, *Occup. Med.*, through *Manufacturing Chemist* 19, 162 (1948).

Testing of Fungicides

Details are given for testing fungicidal agents against pathogenic fungi. Of those which were examined for toxicity and skin irritation, only a few long-chain phenyl mercuric derivatives proved satisfactory from the point of view of being nontoxic, nonirritating, colorless, odorless, readily miscible, and compatible with various materials. L. C. Barail, *Am. Dyestuff Reporter* 37, 257-8, 281-2 (1948).

Newer Insecticides

One of the major problems facing entomologists today is to keep pace with the insecticide chemists in determining the place of new materials in controlling the many insects of economic importance. This is certainly true in the field of veterinary entomology. During the war years, personnel in federal and state institutions devoted little time to research on livestock pests. The new or relatively new insecticides of special interest for such applications are benzene hexachloride, chlorinated camphene, chlordane, the methoxy analog of DDT, dimethoxy diphenyl trichloroethane, and dichlorodiphenyl dichloroethane (TDE). As an illustration, the action of chlorinated camphene against lice on cattle and other stock seems to be comparable with that of DDT, although extensive field tests have not been conducted. It may be superior to DDT in controlling the lone-star tick and the winter tick. F. C. Bishopp and E. F. Knipling, *Ind. Eng. Chem.* 40, 713-6 (1948).

Perfumed Disinfectants

British disinfectants based largely on chlorophenols, are perfumed to mask the phenolic odor. Approximate formulas for four commercial disinfectants are the following:

	Disinfectant Product			
Ingredient	I	II	II	IV
Chlorophenols ...	3-5	4	4	3
Phenols	—	—	—	—
Alcohol	10-15	—	2	—
Terpineol	8-12	2	2	2
Essential oils	—	1	2	5
Soap base	10	10	10	10-15
Distilled or soft water, to	100	100	100	100

Some wetting agents such as Aerosol OT, have a synergistic effect on the active disinfectant ingredients. The alkalinity should not exceed pH 10, since alkali lowers disinfectant power, may cause darkening of the fluid, and decomposition of essential oils. Suitable essential oils to provide a pleasant odor and blend with the odor of the phenolic ingredients are eucalyptus, bay, clove, cinnamon, wintergreen, ti-tree, lemongrass, thyme, nutmeg, copal balsam, and styrax. The oils themselves may possess some germicidal activity.

A straight soap base or a sulfated oil may be used as emulsifying agent. The choice of this will affect the essential oil which can be added. Sulfated oil depresses bactericidal activity, and if used, requires a higher proportion of phenolic substance. G. V. James, *Soap, Perfumery & Cosmetics* 21, 250-2 (1948).

Chlorinated Terpenes

The effectiveness of dusts and sprays against different species of insects was studied, the dust including five percent benzene hexa chloride, five percent DDT, 10 per cent bornyl chloride, 10 per cent dipentene dihydrochloride, and the sprays including tricyclene chloride, dichlorocymene, 15 per cent DDT in terpinolene, 15 per cent benzene hexachloride in terpinolene, 15 per cent DDT in tricyclene chloride, and in dichlorocymene. While DDT and benzene hexachloride showed the higher insecticidal power, chlorinated terpene derivatives showed considerable activity. The para-menthane structure affords a good support for the activity of the halogen. L. Desalbres and R. Labatut, *Chimie & industrie* 58, 443-8: through Chem. Abs.

Parasiticide

2,3-Dichloro-2,3-dihydro-1,4-naphthalene dione is shown to be fungicidal, bactericidal, and insecticidal. It is also repellent to insects such as the black carpet beetle. E. C. Ladd, to U.S. Rubber Co. U.S. Patent No. 2,435, 499.

1080 Toxic to Chickens

Sodium fluoracetate or "1080" rodenticide is toxic to White Leghorn chickens. The maximum tolerant dose was found to be 4-5 mg. per kilogram of body weight. C. E. Cottral, G. D. Dibble, and B. Wintoon, *Poultry Sci.* 26, 610-13.

Fungicide

2,4-Dinitrophenyl thiocyanate is claimed as a toxicant for fungi, bacteria, mold etc. when used as a dust, spray, or impregnating solution. A. L. Flenner and R. A. Kabert, to E. I. du Pont de Nemours & Co. U.S. Patent No. 2, 433,106.

TRADE NEWS . . .

Verrault to Geigy

Howard N. Verrault, previously director of sales in the southwest for R. J. Prentiss, Inc., New York, has just joined the sales staff of Geigy Co., New York. He was eastern sales manager for Velsicol Corp., Chicago, for two years prior to joining Prentiss. Mr. Verrault's activities with the insecticide division at Geigy will be concentrated on the sale of DDT and other economic poisons of the company's line.

Creco 30 Years Old

Creco Co., Long Island City, N. Y., is currently celebrating its 30th anniversary. The company, which manufacturers products for sanitation, was founded by Benjamin Newman, president. Creco Co. is responsible for a number of innovations in industrial sanitation and continues to promote its educational program for better sanitary facilities in industrial plants. A party to celebrate the company's thirtieth birthday will be given at the main plant in Long Island City and all members of its out-of-town branches will be invited .

Deitchman Joins Odora

The appointment of Stanley A. Deitchman, formerly of Weiss & Klau, New York, as sales manager of Odora Co., New York, was announced last month. In addition to his duties as sales manager, he will be in charge of all promotional and advertising activities of the company.

Jones Heads Spice Assn.

Lester W. Jones, director of purchases of McCormick & Co., Baltimore, was elected president of the American Spice Trade Association at the group's 42nd annual convention at the Hotel Astor, New York, last month. Previously he had served as a director of the Spice Association and was a member of the Spice Industry Advisory Committee. Mr. Jones has been in the spice and extract business since 1931, when he was appointed assistant to the vice-president of McCormick & Co. Later he was appointed to his present position of purchasing director. During the war he served with the War Production Board. A native of Baltimore, and a past president of the Drug Exchange of that city, he attended Jefferson School in Muncie, Ind. and Baltimore Business College. At 46, Mr. Jones is the youngest president the Spice Association has ever elected. He has been active in the affairs of the National Association of Insecticide & Disinfectant Manufacturers.

LESTER W. JONES

New U. S. Sanitary Plant

U. S. Sanitary Specialties Corp., Chicago, recently purchased a new plant at California and Taylor Sts., Chicago. The acquisition provides 92,000 square feet of floor space, and has a four car switch track and loading docks for 16 trucks.

Televise Insecticides

Insecticides and insects in action were televised in Philadelphia May 17 during a program explaining the activities of Rohm & Haas Co. of that city. Seen and heard on the program were an interview with Dr. D. S. Frederick, vice-president in charge of sales of Rohm & Haas, and the company's film, "Our Constant Enemy—the Insect." The program was one of a weekly series explaining various Philadelphia businesses, under the sponsorship of the Philadelphia Chamber of Commerce and Station WFIL-TV.

Camp Chemical Relocates

Camp Chemical Co., Brooklyn, recently moved to new and larger quarters at 1560 Sixty-second St., Brooklyn 19. The company, which was formerly located at 1281 E. 49th St., Brooklyn, occupies three buildings for its plant, offices and laboratory at the new address.

A folder on chemicals for summer camps was recently issued by the company. The folder is printed in green and brown, and lists in addition to the line of products the company specializes in making for camps, a survey of camp sanitary conditions. Another folder on Camp poison ivy killer was included in a recent mailing by the company.

Opens Chicago Office

The opening of a Chicago sales office at 201 N. Wells St. under the direction of Hyman Gold, divisional sales manager, who will be assisted by John Clifford was announced late last month by Chemical Corporation of Colorado, Denver. Russell Ryland has been appointed by the company as divisional sales manager for Oklahoma and Kansas. Dr. Dana Sherrill became plant superintendent in Denver effective June 10. He was formerly an engineer for Heckerthorn Corp., and more recently professor of chemical engineering at Denver University.

Poisons Officials Meet

A discussion of uniformity in regulations and the development of cooperation between state and federal enforcement officials was the highlight of the recent five-day meeting of the executive committee of the Association of Economic Poisons Control Officials at the Insecticide Division, USDA, Washington, D. C. Among the topics taken up at the meeting were: Definition of economic poisons, product names, ingredient and net

content statements, directions for use, registration, advertising not accompanying the product, labels for large containers, testing economic poisons, permits for shipment for experimental use, labeling insecticides containing such ingredients as DDT, benzene hexachloride, etc., and antidotes and precautionary statements.

New Germicide Dispensers

First shipments of the "Sterimatic Model 'C' " dispenser for germicides and detergents were announced last month by Murdock Distributors, Inc., Los Angeles. The dispenser is designed for use in cold sanitation of glasses, flatware and dishes used in public eating and drinking places. It is priced at $9.85 per unit and will be sold through sanitary dealers.

"Model 'C' " is a self-contained unit of plastic, stainless steel and rubber, which can be attached to any wash or rinse tank. It automatically dispenses the germicide or detergent each time the rinse or wash tank is filled. It does not require attachment to plumbing fixtures, service or maintenance, according to the manufacturer.

Koppers Plant Resuming

Resumption of some operations at the tar products division of the Koppers Co., Kearny, N. J. plant is now under way following an explosion and fire that took the lives of 10 men and injured several others May 17. Some packaging operations of naphthalene products have been resumed, although the distillation unit, which bore the brunt of the explosion and fire is still knocked out. It is hoped that distilling operations may be resumed by the end of June, a company spokesman stated early this month.

Building New Plant

Nu-Way Products Co., manufacturers of disinfectants and bleaching agents, North Little Rock, Ark., is erecting a new ceramic tile, fireproof building at Fifth and Gum Streets. About 6,000 square feet of floor space will be provided. Construction is scheduled for completion in August.

West Insecticide Atomizer

West Disinfecting Co., Long Island City, N. Y., has developed an atomizer type insecticide installation coming in six different styles to provide permanent insect control. The West atomizer system can be operated by air-pressure, steam pressure or carbon dioxide gas pressure. The atomizer has 10 atomizing nozzles which dispense the insecticide into the upper and lower portions of the area to be treated. The West atomizer installation is tailored to fit plant requirements, regardless of size or the nature of the industry. A detailed booklet is available on the method of installation and operation.

INSECTICIDE REGISTRATION DEADLINE
June 25, 1948

All insecticides and fungicides included in the regulations for the Federal Insecticide, Fungicide and Rodenticide Act of 1947 must be registered by June 25.

Manufacturers of such economic poisons who have not yet registered with the U. S. Department of Agriculture, must do so before June 25.

Applications for registration should be addressed to Insecticide Division, Livestock Branch, Production and Marketing Administration, U. S. Dept. of Agriculture, Washington 25, D. C. No fees are charged for registration.

Rodenticide and herbicide products were to have been registered with the U.S.D.A. before December 25, 1947, but registration for insecticide and fungicides, comprising a much larger volume, was set ahead six months.

PCO's to Meet in Toronto

The 16th annual convention of the National Pest Control Association will be held at the Royal York Hotel, Toronto, Canada, Monday, Tuesday and Wednesday, Oct. 18, 19 and 20, 1948. I. B. Carncross, Syracuse (N.Y.) Chemical Co., is general chairman.

Advises on Insecticides

The importance of closely following directions in using new insecticidal materials was stressed in a recent address by Dr. T. Walter Reed of California Spray Chemical Corp., Haddonfield, N. J., in a recent address before the Northeast Tennessee Section of the American Institute of Chemical Engineers, meeting at Bristol, Va. Although economic entomologists have spent a large amount of time on comparative spray tests of many new chemicals and have amassed a great deal of toxicological data, they do not, as yet, know how, when or where the newer insecticides may be economically and safely used, Dr. Reed stated.

New Insecticide Research

The inauguration of a research service which will deal with the use of DDT and other insecticides in paints was announced during May by Centro Research Laboratories, Briarcliff Manor, N. Y. The new service includes such steps as finding the specific formulations for various types of paints, definite and detailed manufacturing instructions and complete laboratory data based on recognized OTI tests.

Sprayer Assn. Sect.

Earl D. Anderson was appointed last month as secretary of the National Sprayer and Duster Association, Chicago, succeeding John Benham, who resigned. At the same time it was announced that Mr. Anderson had joined the staff of Frank J. Zink Associates, Chicago, legal counsel for the Association. Previously, Mr. Anderson was connected with Republic Steel Corp. as agricultural engineer and manager of the Agricultural Extension Bureau since 1936.

General Chem. Building

Construction of a plant for the manufacture of aerosol propellants by General Chemical Division, Allied Chemical & Dye Corp., New York, at Baton Rouge, La., is now in progress. In addition, General has under advisement plans for the erection of a large plant at Tonawanda, N. J., where the division recently acquired a 28 acre site.

Issues New Price List

Baird & McGuire, Inc., Holbrook, Mass., recently issued a new schedule of prices for their disinfectants, insecticides and related chemical specialties.

Hosp. Sanitation Course

Hospital sanitation was one of numerous subjects on the curriculum of a one-week school for hospital housekeepers, the first of its kind, sponsored by the American Hospital Association, through its Illinois and Chicago units, in Chicago, April 26 to 30.

Members of the instructional staff included J. V. Blankmeyer and Louis A. Poleo, sanitation consultants with Industrial Sanitation Counselors, Louisville, Ky., who respectively handled the subjects of "Sanitation Level Ratings" and "Floors and Their Maintenance." Another subject, "Insect and Rodent Control" was presented by Dr. Nathan R. Brewer, lecturer in physiology, and superintendent of Animal Quarters, University of Chicago, while the subject of "Cleaning Equipment and Supplies" was handled by Paul Heidman, superintendent of building operations, Detroit Edison Co.

Chi. Chem. Exposition

The fifth National Chemical Exposition will be held Oct. 12-16 at the Coliseum, Chicago, and will include the revival of the National Industrial Chemical Conference, which was not scheduled at the last Show in 1946. The biennial exposition is sponsored by the Chicago Section of the American Chemical Society. Noted speakers who will present papers on new developments, discoveries and applications in industrial chemistry, will be a feature of the Conference. Dr. L. E. Clifhorn is chairman of the exposition committee. Sessions will be held in the Coliseum annex under the same roof as the show.

Hudson Sprayer Folder

H. D. Hudson Manufacturing Co., Chicago, recently issued a six page folder illustrating and describing its new line of trailer type power spraying units and spray booms. The Hudson "Peerless" model power sprayers shown in the folder are mounted on pneumatic tired wheels for moving by hand or automotive power and on skids for permanent mounting in trucks, etc. Smaller, more compact models of high pressure sprayers, the "Defender" and "Clipper" are also shown. The Hudson "Multi-Booms" for attachment to power sprayers are equipped with adapters for mounting on any of the four Hudson power sprayers.

Name West Distributor

West Disinfecting Co., Long Island, N. Y., was recently appointed distributor for the newly developed line of electric floor machines produced by the Corbin Screw Division of American Hardware Corp. Available in twin brush or reversible single brush models, the Corbin machines are equipped with a specially designed General Electric motor that is part of the floor machine.

New Eston Insecticide

A two-page bulletin on "Tetron*—100," an organic phosphate insecticide material, was issued recently by Eston Chemicals, Inc., Los Angeles. The new compound, which is the successor to Eston hexaethyl tetraphosphate, contains 40 percent tetraethyl pyrophosphate and 60 percent other related organic compounds. Insecticides made with "Tetron*—100" generally carry 50 percent of "Tetron" in a suitable solvent, together with an emulsifying and wetting agent.

Salesmen Set Golf Dates

Golf outings of the Salesmen's Association of the American Chemical Industry will be held July 22 at Knoll Golf Club, Boonton, N. J.; Aug. 18, at Pomonok Country Club, Flushing, N. Y.; and Sept. 15, at Montclair Golf Club, Montclair, N. J., following the opening tournament, which was held June 15 at Bonnie Briar Country Club, Larchmont, N. Y.

Robertet N. Y. Office

Establishment of a New York office at 125 E. 23rd St. for the sale of perfuming materials was announced recently by Robertet & Co. of Grasse, France.

CWS Insecticide Reports

A series of reports prepared by the Army Chemical Corps and the Chemical Warfare Service of the Army Service Forces dealing with insecticides, insect repellents, rodenticides, impregnation of clothing with insecticides, miticides and means for dispersing rodenticides are now on sale and available from the Office of Technical Services, U. S. Department of Commerce. Among the reports available are: PB-81709, "Insect and Rodent Control, Quarterly Progress Report, No. 14, April-June, 1947," 38 pages, $4 (photostat), $1.75 (microfilm); PB-79158, "Insect and Rodent Control, Quarterly Progress Report, No. 13, Jan.-Mar., 1947" 22

pages, $2 (photostat), $1. (microfilm); PB-4034 on hexachlorocyclohexane, 31 pages, $1.25; PB-60925, "Pharmacological Antagonism Between Stereoisomers of Hexachlorocyclohexane," one page $1; PB-52262, "Quarterly Progress Report on Insect and Rodent Control," 48 pages, $4; PB-46455, "Estimation of Hexachlorocyclohexane in Impregnated Cloth," 15 pages, $1.

Wood Publicity Division

The addition of a publicity and public relations division to its sales promotion and advertising program was announced last month by G. H. Wood & Co., Toronto, Canada. Charles R. Cornell has been put in charge of the new division. A former newspaper man and trade publication writer, Mr. Cornell was formerly associated with Dominion Rubber Co., as assistant to the advertising manager in charge of public relations for three years. He was also a member of the Public Relations Bureau of the Canadian Industries Ltd., Montreal.

McCormick Elects Catron

General Thomas Benton Catron II, vice-president of McCormick Overseas Trading, Inc., a subsidiary of McCormick & Co., Baltimore, was recently elected to the company's board of directors. General Catron, a graduate of the United States Military Academy at West Point, N.Y., was active in the Army through World War I and up to 1936, when he was retired. He joined McCormick & Co. in 1946, following his retirement in 1946 from active duty in the second World War.

Issue Disease Stamps

Two-color stamps, one and one-half by one inch are being used by Continental Chemiste Corp., Chicago, exterminators, to make the public more conscious of the fact that insects and rodents spread disease. The stamps, which are printed in red and blue, and carry the drawing of an infant's head and shoulders, bear the words: "We fight disease through insect and rodent control. Stamps may be purchased through Continental at 2068 W. Ogden Ave., Chicago 12.

New Chlordane Insecticide

A new, triple purpose insecticide, "Voo Doo, White Magic," with two percent technical chlordane, was

developed recently by Xterminator Products Corp., Jersey City, N. J. It is packed in pints, quarts, gallons, 55 gallon drums and five gallon sizes. A sprayer attachment to fit over the top of bottles accompanies the household size packages. The new insecticide is recommended for use in homes and for industrial purposes, gardens and as a dog or other animal spray. It is a stable water emulsion.

Vagtborg Leaving Midwest

Dr. Harold Vagtborg, president and director of Midwest Research Institute, Kansas City, Mo., since its inception on Jan. 1, 1945, announced during May his resignation to become president and director of Southwest Research Institute, Houston, Tex. In addition, he will serve as director of the Foundation of Application Research and technical director of the 3,500 acre Essar Ranch, all located just outside the city limits of San Antonio, Tex.

Pennsalt Transfers Two

Two changes in district sales representatives of the special chemicals division of Pennsylvania Salt Manufacturing Co., Philadelphia, were effected recently. William D. Wilson was named to cover Northern New Jersey and New York city, while John M. Davidson was assigned to the Pittsburgh district. Mr. Davidson, who succeeds William J. Hennessy, now Pittsburgh district sales manager of special chemicals, formerly covered the territory which Mr. Wilson has been assigned.

Lyons in Innis Shift

The appointment of Joseph W. Lyons as New England manager of the insecticide division of Innis, Speiden & Co., New York, was announced during May. He succeeds George Marks who has been made West Coast manager of insecticide sales. Mr. Lyons has been with Innis, Speiden since January, 1947, having previously been connected with the insecticide division of General Chemical Division, Allied Chemical & Dye Corp., New York. He received his B.S. degree in dairy chemistry from Rutgers University, where he also did post-graduate work. During the recent war, Mr. Lyons served for five years as a paratrooper.

Rating Plant Sanitation

A plan for rating sanitation in food plants is discussed in two articles appearing in the March and April issues of *Food Industries* magazine written by Mohe H. Solworth, sanitation consultant of Joseph E. Seagram and Sons, Inc., Louisville, Ky. The articles have been reprinted by the National Sanitary Supply Association, Chicago, which is distributing copies of the reprints.

Schwartz Opens Office

Dr. Louis Schwartz, formerly chief, section of dermatology of the U. S. Public Health Service, recently announced the opening of offices at 915 19th St., N. W., Washington 6, D. C. Dr. Schwartz will specialize in occupational and other contact dermatoses.

Hyman Chlordane Folder

Technical supplement #206, a bulletin dealing with the use of chordane to control clothes moths, carpet beetles and other pests that attack stored products, was issued recently by Julius Hyman & Co., Denver.

Hospital Show Exhibitors

Huntington Laboratories, Huntington, Ind., introduced their new surgical soap dispenser with single or twin outlets for hospital use at the 18th annual Tri-State Hospital Assembly in Chicago last month. Also shown was an improved alcohol dispenser, along with leading items in the company's hospital sanitary maintenance lines. J. L. Brenn, company president, was in charge of the presentation, assisted by W. E. Fox and M. D. Brown.

Midland Laboratories, Dubuque, Ia., also had on display a new and improved surgical soap and alcohol dispenser, with foot-pedal attachment. Featured, too, was their "Mill-O-Cide" insecticide for controlling pests in hospital pantries, with an electrical spray machine for its application. In charge were Walter L. Brown, Carl Goff, L. S. Jacobi and C. F. Hillyard.

Diversey Corp., Chicago, presented, for the second time at any trade show, its new type general cleaner, "Divoluxe," and a sterilizing agent, "Diversol." E. J. Marxer, sales manager, assisted by W. H. Rush, Wm. Babanack, and Paul Peterson, gave demonstrations to nurses and doctors and explained, also, the special Diversey service covering every phase of hospital sanitation.

Hillyard Sales Co., St. Joseph, Mo., demonstrated their new two-brush floor scrubbing and polishing machines and other equipment and supplies. In charge was W. A. Schmaltz, assistant sales manager, assisted by Ellis Alred and Jerry Gafford.

Another representative of the sanitary chemical field in the show was Vestal, Inc., St. Louis, Mo., whose staff was headed by F. J. Pollnow, president, assisted by Al Rotermund and J. A. Walker. Among other exhibitors were the Hild Floor Machine Co., Chicago, and the Walter G. Legge Co., New York.

Outstanding among topics discussed at the sessions of hospital laundry managers was a talk on "The New Textiles," by Donald E. Tuttle, head of the Proctor & Gamble laundry research laboratory at Ivorydale, O.

N.S.S.A. Membership Up

The National Sanitary Supply Association, Chicago, last month released the names of twenty-one new members who joined during the recent annual convention. Complete tabulation of the roll, to determine if the goal of 1,000 members by convention time had been attained, had to be deferred, vice-president Leo J. Kelly announced, pending recovery of the association's office manager from an attack of the measles.

Aromatic Prods. Moves

Relocation of its executive and accounting offices and perfume laboratories at new quarters in Stamford, Conn., was effected during May by Aromatic Products, Inc. The company will continue to maintain sales and service offices at 15 E. 30th St., New York, where some stock will be carried. The company's new quarters at 18 Elmcroft Road, Stamford, are located within a short distance of the main factory at Springdale, Conn.

"Chemi-Notes" on Labeling

"Chemi-notes," external house magazine of Baird & McGuire, Inc., Holbrook, Mass., for April is devoted to discussions of various aspects of labeling required under the new Federal Insecticide, Fungicide and Rodenticide Act. The May issue also contains an article on labeling under the Act.

N.A.I.D.M. CONVENTION

(*From Page 137*)

time or access to much of the information your Association gathers and distributes. The annual dues you pay for membership in this Association would not be sufficient for an individual member to cover completely one of the many matters that come to you in our bulletins during a year. I believe most of you realize this.

Suggestions have been made by a few members that our dues should be based on sales volumes, as is the case in a few large trade associations. This has been fully discussed and your Board believes it is obvious to manufacturers in our industry that this is not equitable. The general opinion is that the benefits derived, and the opportunities to receive assistance in business problems, are shared equally by all members, and dues should be assessed accordingly.

The coordinating of committee work, convention plans, and correspondence with members regarding individual problems, make every day a full day. Many of our committees are very active. This is especially true of our scientific committees. They are really doing a grand job. We are also cooperating through committees with the Federal Trade Commission on wax products trade practice rules, and with the Department of Interior on rodent control.

Individual members should make a practice of keeping the association office informed of any matters of interest to all members. Write us or call and discuss your problems,—registration, fees, law interpretations, and any other matters that are not trade secrets. We need and welcome constructive ideas. We have helped many individual members. Our ability to do so is often materially helped by the information we have received from another member regarding his experience.

As announced in our Bulletin 40-48, the 1947 Official Test Insecticide will be used through October 1948, when a new OTI may be prepared on the recommendations of our scientific committees which are now working on this matter. This handling of the existing stock of OTI will result in a sizable saving of money.

Among our future plans is the formulation of a questionnaire to be sent out to our members requesting them to list the names, types, etc. of all their products. This will enable us to serve our members in various ways.

Every association policy is checked with the president and with the Executive Committee. Their cooperation is prompt and always helpful and decisive. Mrs. Sullivan puts in long hours on many subjects requiring speedy attention. I thank each member for his sincere cooperation.

TOXICITY OF DDT

(*From Page* 159)

results for one to two months only on new sheet metal, glass, tile, palmetto thatch, and new metal screen. Unsatisfactory mortalities were obtained from DDT-xylene deposits on plexiglass, shellacked wood, cement and waxed wood.

A comparison of the residual effectiveness of DDT deposits from DDT-xylene emulsion, DDT-kerosene solution, and water-wettable DDT suspensions on various surfaces has been made. In general, the relative effectiveness of the DDT-kerosene deposits on different surfaces followed the same general pattern as DDT-xylene deposits, but the level of effectiveness was somewhat lower in the DDT-kerosene formulations. The water-wettable DDT deposits were superior to the DDT-xylene deposits on the absorbent surface of cement, and somewhat better on the smooth surfaces of glass, new sheet metal, and tile. The water-wettable DDT deposits were inferior on plywood, palmetto thatch, and bamboo. Very little residual toxicity was evident from water-wettable DDT applications on simulated adobe, although visual evidence indicated an adequate treatment.

A study was made on the effects of household cleaning and maintenance operations upon the residual effectiveness of DDT deposits. Dry-cleaning of fabrics rapidly reduced residual effectiveness, but washing with soap and water had little immediate effect. The use of a hot iron for pressing fabrics rapidly reduced residual effectiveness. The initial treatment with a vacuum cleaner had more effect than subsequent treatments, while vigorous brushing apparently removes more DDT with each brushing. Dust removal by means of a cloth caused only a gradual decrease in effectiveness. The application of the DDT xylene emulsion on shellacked or waxed wood, and on waxed linoleum had very low residual effectiveness. Wax applied to surfaces previously treated with DDT covered the deposits to a large extent.

References

(1) Clapp, J. M.; Fay, R. W.; and Simmons, S. W.: The comparative residual toxicity of DDT to *Anopheles quadrimaculatus* when applied on different surfaces. Pub. Health Rep. *63*: (No. 5) 158-170 (January 31, 1947).

(2) Simmons, S. W., and staff: Techniques and apparatus used in experimental studies on DDT as an insecticide for mosquitoes. Pub. Health Rep., Supplement No. 186, 3-20 (1945).

(3) Fay, R. W.; Simmons, S. W.; and Clapp, J. M.; Extended laboratory investigations on the toxicity of DDT residues to adults of *Anopheles quadrimaculatus*. Pub. Health Rep. *65*: (No. 5) 149-158 (January 31, 1947).

Insecticides for Mills

Insect control problems in flour mills and other cereal processing plants were given attention at conventions of two national trade organizations in the milling field held last month in Chicago. Corn mill sanitation was the subject of a panel discussion during the sessions of the American Corn Millers Federation, May 10, presided over by James A. Gwinn of Gwinn Milling Co., Huntington, W. Va. Among members of the panel were Dr. R. T. Cotton, Bureau of Entomology and Plant Quarantine, U.S.D.A., Manhattan, Kans.; T. F. Winburn, Industrial Fumigant Co., Chicago; George B. Wagner, entomologist with Pillsbury Mills, Minneapolis, Minn., and representatives of other milling companies.

At the May 18 meeting of the Association of Operative Millers, Dr. Cotton was again a program speaker, his subject being "Objectives of the Research Program on Insect Control Established Under the Research and Marketing Act." Following him, Mr. Wagner of Pillsbury Mills also spoke on "The Insect-Infested Wheat Problem."

Further indication of the intensified interest which millers are taking in insect control in their plants was given by the *American Miller*, trade publication of the industry, which devoted its April issue to the subject of mill sanitation. Among authors of papers published by the magazine were Conrad C. Johnson, insecticide div., Innis, Speiden & Co., New York; J. L. Maxwell, fumigant sales div., Dow Chemical Co., Midland, Mich.; J. Carl Dawson, Industrial Sanitation Service, St. Louis, Mo.; George H. Chapman, insecticide dept. American Cyanamid Co., New York; Richard T. Cotton and J. C. Frankenfeld of the USDA, Bureau of Entomology and Plant Quarantine, and George B. Wagner, dept. of biological control, Pillsbury Mills, Minneapolis.

Hooker Has New Solvent

A new chemical compound, "o-Chlorobenzenotrifluoride" (o-chlorotrifluoromethylbenzene), which may be of use as a special solvent, was introduced recently in pilot plant quantities by Hooker Electrochemical Co., Niagara Falls, N. Y. It is a colorless, aromatic liquid which is characterized by the CF_3 group. This radical is said to be generally stable to light, heat and chemical reaction. Its distillation range is 150.9° to 152.4° C.; freezing point is —7.4° C.; and its specific gravity at 15.5° C. is 1.379. More details on the new compound are contained in technical data sheet 363, which is available with samples.

Johnson Joins Malmstrom

James L. Johnson, secretary of the Chicago Perfumery, Soap and Extract Association and formerly purchasing agent for G. Barr & Co., Chicago, was recently named to the Chicago sales staff of N. I. Malmstrom & Co., New York.

LIQUID HAND CLEANERS

(*From Page* 40)

cent of olive oil, the rest being coconut oil. Such soaps are used in special dispensers in maternity wards or nurseries of hospitals. A liquid soap of this kind lathers faster than soda olive oil cake soap and is more convenient and sanitary to use from dispensers. For these reasons the liquid castile soaps have been more popular with doctors and nurses. (3)

Soaps made with fairly high, but not excessive amounts of glycerine also exert an emollient and demulcent effect on the skin. A glycerine liquid may be made as follows: (12)

Soft soap	35	parts
Glycerine	21	"
Water	7	"
Alcohol	14	"
Talc or pumice		

Excessive alkalinity is controlled by adding oleic acid. The soap is allowed to stand for several days, the longer the better, and then filtered. Perfume and color may be added if desired.

Now—Soap Skin Cleaners

SINCE there are some persons who are sensitive to soap and because there are certain skin conditions where soap is contraindicated, dermatologists have sought other cleansing agents. Some years ago, they found that sulfonated oils could be used. Later other surface active agents were made available in large numbers, but only a small proportion were suitable as skin cleaners. These newer agents have assumed importance not only in dermatological conditions, but as industrial hand cleaners for the small proportion of workers who cannot use ordinary soaps. (1, 28)

Sulfonated or, more correctly, sulfated oils have found general acceptance among dermatologists for use where soap may not be employed. One such preparation, similar to a product (Acidolate) advertised to doctors, consists of: (29)

Sulfated vegetable oils	25 cc.
Liquid petrolatum	25 cc.
Water, to make	100 cc.

In their search for hand cleaners suitable for the prevention of industrial dermatitis Klauder, Gross and Brown (28, 30) developed several products; the following being the preferred formula of one of these cleaners:

Sulfonated olive oil	38.5	per cent
Light liquid petrolatum	31.5	" "
Sulfonated neat's foot oil	20.0	" "
Gelatin, 25 per cent aqueous solution	10.0	" "

This product is clear at room temperature but becomes turbid between 50 and 60°F. and solidifies at lower temperatures. Turbidity may be prevented by adding castor oil or solvents.

Dr. Louis Schwartz, formerly of the U. S. Public Health Service, has done considerable work on the development of industrial skin cleaners. He has prepared a number of products, including liquid preparations, which utilize the several advantageous properties of soap, sulfonated oils and wetting agents. For example, as a liquid skin cleanser for general industrial use he (31) recommends a mixture of equal parts of potash coconut oil soap and sulfonated castor oil to which is added one per cent of synthetic wetting agent (e. g. Nacconol, Duponol, Santomerse, etc. etc.). For workers exposed to the defatting action of solvents, degreasers and cutting oils, a superfatted liquid mixture is suggested by Schwartz, (32) as follows:

Neutral sulfonated caster oil	50	parts
Liquid soap	44	"
Lanolin	5	"
Perfume	1	part

Another industrial skin cleaner which this authority (33) developed and recommended in 1941 consists of sulfonated castor oil having a pH of 7.2 and an oil content of 50 per cent, with 2 per cent of one of the synthetic wetting agents. Providing a good cleanser which does not defat the skin, it may be used in the same way as liquid soap. The cleansing powers of this mixture can be increased without materially increasing its irritant properties by adding 1 to 2 per cent of an alkali like trisodium phosphate or sodium hexametaphosphate. For workers having dry or inflamed skins he suggested (32) a modified type of liquid cleaner such as the following:

Neutral sulfonated castor oil (pH 6-7)	93	parts
Castor oil	5	parts
Synthetic detergent	2	parts

Of course the synthetic detergents or surface active agents are finding wider use in the production of liquid skin cleaners. (1, 34) This, however, is a long and rather complicated story in itself.

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Polyphosphate Combination

A water-soluble glass consists essentially of K_2O, P_2O_5 and SiO_2. The molar ratio of K_2O:P_2O_5 is from 1.8:1 to 0.6:1. At least one mol per cent of SiO_2 is present. R. E. Hall and C. J. Munter, to Hall Laboratories, Inc. Canadian Patent No. 447,290.